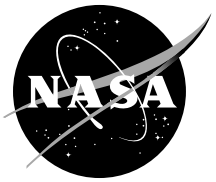
NASA/TM—2003–212933



# FY 2002 Scientific and Technical Reports, Articles, Papers, and Presentations

*Compiled by*
*B.A. Fowler*
*Marshall Space Flight Center, Marshall Space Flight Center, Alabama*

***December 2003***

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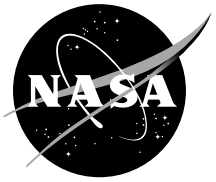

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*B.A. Fowler*
*Marshall Space Flight Center, Marshall Space Flight Center, Alabama*

National Aeronautics and
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***December 2003***

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## FOREWORD

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GEORGE C. MARSHALL SPACE FLIGHT CENTER
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FY 2002 SCIENTIFIC AND TECHNICAL REPORTS,
ARTICLES, PAPERS, AND PRESENTATIONS

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TM—2001–211221 October 2001

Guidelines for the Selection of Near-Earth Thermal Environment Parameters for Spacecraft Design. B.J. Anderson, C.G. Justus,* and G.W. Batts.* Engineering Systems Department, Engineering Directorate, and *Computer Sciences Corporation.

Thermal analysis and design of Earth-orbiting systems requires specification of three environmental thermal parameters: the direct solar irradiance, Earth's local albedo, and outgoing longwave radiance (OLR). In the early 1990s data sets from the Earth Radiation Budget Experiment were analyzed on behalf of the Space Station Program to provide an accurate description of these parameters as a function of averaging time along the orbital path. This information, documented in SSP 30425 and in more generic form in NASA/TM–4527, enabled the specification of the proper thermal parameters for systems of various thermal response time constants.

However, working with the engineering community and SSP–30425 and TM–4527 products over a number of years revealed difficulties in interpretation and application of this material. For this reason it was decided to develop this guidelines document to help resolve these issues of practical application. In the process, the data were extensively reprocessed and a new computer code, the Simple Thermal Environment Model (STEM) was developed to simplify the process of selecting the parameters for input into extreme hot and cold thermal analyses and design specifications. In the process, greatly improved values for the cold case OLR values for high inclination orbits were derived. Thermal parameters for satellites in low, medium, and high inclination low-Earth orbit and with various system thermal time constraints are recommended for analysis of extreme hot and cold conditions. Practical information as to the interpretation and application of the information and an introduction to the STEM are included. Complete documentation for STEM is found in the user's manual, in preparation.

TM—2001–211222 October 2001

Simple Thermal Environment Model (STEM). C.G. Justus,* G.W. Batts,* B.J. Anderson, and B.F. James. Engineering Systems Department, Engineering Directorate, and *Computer Sciences Corporation.

This report presents a Simple Thermal Environment Model (STEM) for determining appropriate engineering design values to specify the thermal environment of Earth-orbiting satellites. The thermal environment of a satellite consists of three components: (1) Direct solar radiation, (2) Earth-atmosphere-reflected shortwave radiation, as characterized by Earth's albedo, and (3) Earth-atmosphere-emitted outgoing longwave radiation. This report, together with a companion "guidelines" report provides methodology and guidelines for selecting "design points" for thermal environment parameters for satellites and spacecraft systems. The methods and models reported here are outgrowths of Earth Radiation Budget Experiment satellite data analysis and thermal environment specifications discussed by Anderson and Smith (1994). In large part, this report is intended to update (and supersede) those results.

TM—2001–211301 October 2001

Equations of Motion for the g-LIMIT Microgravity Vibration Isolation System. Y.K. Kim and M.S. Whorton. Vehicle Control Systems Group, Transportation Directorate.

A desirable microgravity environment for experimental science payloads may require an active vibration isolation control system. A vibration isolation system named Glovebox Integrated Microgravity Isolation Technology (g-LIMIT) is being developed by NASA Marshall Space Flight Center to support microgravity science experiments using the microgravity science glovebox. In this Technical Memorandum, the full six-degree-of-freedom nonlinear equations of motion for g-LIMIT are derived. Although the motivation for this model development is control design and analysis of g-LIMIT, the equations are derived for a general configuration and may be used for other isolation systems as well.

TM—2001–211330 October 2001

Internal Thermal Control System Hose Heat Transfer Fluid Thermal Expansion Evaluation Test Report. P.O. Wieland and H.D. Hawk.* Flight Projects Directorate and *Summer High School Apprenticeship Research Program.

During assembly of the *International Space Station*, the Internal Thermal Control Systems in adjacent modules are connected by jumper hoses referred to as integrated hose assemblies (IHAs). A test of an IHA has been performed at Marshall Space Flight Center to determine whether the pressure in an IHA filled with heat transfer fluid would exceed the maximum design pressure when subjected to elevated temperatures (up to 60 °C (140 °F)) that may be experienced during storage or transportation. The results of the test show that the pressure in the IHA remains below 227 kPa (33 psia) (well below the 689 kPa (100 psia) maximum design pressure) even at a temperature of 71 °C (160 °F), with no indication of leakage or damage to the hose. Therefore, based on the results of this test, the IHA can safely be filled with coolant prior to launch. The test and results are documented in this Technical Memorandum.

TM—2001–211383 November 2001

Absorbed Dose Determination Using Experimental and Analytical Predictions of X-Ray Spectra. D.L. Edwards. Materials, Processes, and Manufacturing Department, Engineering Directorate.

Electron beam welding in a vacuum is a technology that NASA is investigating as a joining technique for manufacture of space structures. This investigation characterizes the x-ray environment due to operation of an in-vacuum electron beam welding tool and provides recommendations for adequate shielding for astronauts performing the in-vacuum electron beam welding. NASA, in a joint venture with the Russian Space Agency, was scheduled to perform a series of welding in space experiments on board the U.S. Space Shuttle. This series of experiments was named the international space welding experiment (ISWE). The hardware associated with the ISWE was leased to NASA by the Paton Welding Institute (PWI) in Ukraine for ground-based welding experiments in preparation for flight. Two ground tests were scheduled, using the ISWE electron beam welding tool, to characterize the radiation exposure to an astronaut during the operation of the ISWE. These radiation exposure tests used thermoluminescence dosimeters (TLDs) shielded with material currently used by astronauts during extravehicular activities to measure the radiation dose. The TLDs were exposed to x-ray radiation generated by operation of the ISWE in-vacuum electron beam welding tool. This investigation was the first known application of TLDs to measure absorbed dose from x rays of energy <10 keV. The ISWE hardware was returned to Ukraine before the issue of adequate shielding for the astronauts was completely verified. Therefore, alternate experimental and analytical methods were developed to measure and predict the x-ray spectral and intensity distribution generated by ISWE electron beam impact with metal. These x-ray spectra were normalized to an equivalent ISWE exposure, then used to calculate the absorbed radiation dose to astronauts. These absorbed dose values were compared to TLD measurements obtained during actual operation of the ISWE in-vacuum electron beam welding tool. The calculated absorbed dose values were found to be in agreement with the measured TLD values.

TM—2001–211410 November 2001

National Environmental Change Information System Case Study Final Report. S.J. Goodman, R. Ritschard (Deceased),* M.G. Estes, Jr.,** and U. Hatch.*** Space Science Department, Science Directorate, *The University of Alabama in Huntsville, **Universities Space Research Association, and ***Auburn University.

The Global Hydrology and Climate Center and NASA's Marshall Space Flight Center conducted a fact-finding case study for the Data Management Working Group (DMWG), now referred to as the Data and Information Working Group (DIWG), of the U.S. Global Change Research Program (USGCRP) to determine the feasibility of an interagency National Environmental Change Information System (NECIS). In order to better understand the data and information needs of policy and decision makers at the national, state, and local levels, the DIWG asked the case study team to choose a regional water resources issue in the southeastern United States that had an impact on a diverse group of stakeholders. The southeastern United States was also of interest because the region experiences interannual climatic variations and impacts due to El Niño and La Niña. Jointly, with input from the DIWG, a focus on future water resources planning in the Apalachicola-Chattahoochee-Flint (ACF) River basins of Alabama, Georgia, and Florida was selected. A tristate compact and water allocation formula is currently being negotiated between the states and U.S. Army Corps of Engineers (COE) that will affect the availability of water among competing uses within the ACF River basin. All major reservoirs on the ACF are federally owned and operated by the U.S. Army COE. A similar two-state negotiation is ongoing that addresses the water allocations in the adjacent Alabama-Coosa-Tallapoosa (ACT) River basin, which extends from northwest Georgia to Mobile Bay. The ACF and ACT basins are the subject of a comprehensive river basin study involving many stakeholders.

The key objectives of this case study were to identify specific data and information needs of key stakeholders in the ACF region, determine what capabilities are needed to provide the most practical response to these requests, and to identify any limitations in the use of federal data and information. The NECIS case study followed the terms of reference developed by the interagency DIWG. The case study "lessons learned" and "key findings" offer guidelines and considerations to the DIWG for the development and implementation of a NECIS that would support the data and information needs of policy and decision makers at the national, state, and local levels.

TM—2002–211465 January 2002

Materials Science Research Rack–1 Fire Suppressant Distribution Test Report. P.O. Wieland. Flight Projects Directorate.

Fire suppressant distribution testing was performed on the Materials Science Research Rack–1 (MSRR–1), a furnace facility payload that will be installed in the U.S. Lab module of the *International Space Station*. Unlike racks that were tested previously, the MSRR–1 uses the Active Rack Isolation System (ARIS) to reduce vibration on experiments, so the effects of ARIS on fire suppressant distribution were unknown. Two tests were performed to map the distribution of carbon dioxide ($CO_2$) fire suppressant throughout a mockup of the MSRR–1 designed to have the same component volumes and flowpath restrictions as the flight rack. For the first test, the average maximum $CO_2$ concentration for the rack was 60 percent,

achieved within 45 s of discharge initiation, meeting the requirement to reach 50 percent throughout the rack within 1 min. For the second test, one of the experiment mockups was removed to provide a worst-case configuration, and the average maximum $CO_2$ concentration for the rack was 58 percent. Comparing the results of this testing with results from previous testing leads to several general conclusions that can be used to evaluate future racks. The MSRR–1 will meet the requirements for fire suppressant distribution. Primary factors that affect the ability to meet the $CO_2$ distribution requirements are the free air volume in the rack and the total area and distribution of openings in the rack shell. The length of the suppressant flowpath and degree of tortuousness has little correlation with $CO_2$ concentration. The total area of holes in the rack shell could be significantly increased. The free air volume could be significantly increased. To ensure the highest maximum $CO_2$ concentration, the PFE nozzle should be inserted to the stop on the nozzle.

TM—2002–211545 February 2002

Analysis of Graphite-Reinforced Cementitious Composites. R.E. Vaughan. Structures, Mechanics, and Thermal Department, Engineering Directorate.

Strategically embedding graphite meshes in a compliant cementitious matrix produces a composite material with relatively high tension and compressive properties as compared to steel-reinforced structures fabricated from a standard concrete mix. Although these composite systems are somewhat similar, the methods used to analyze steel-reinforced composites often fail to characterize the behavior of their more advanced graphite-reinforced counterparts. This Technical Memorandum describes some of the analytical methods being developed to determine the deflections and stresses in graphite-reinforced cementitious composites. It is initially demonstrated that the standard transform section method fails to provide accurate results when the elastic moduli ratio exceeds 20. An alternate approach is formulated by using the rule of mixtures to determine a set of effective material properties for the composite. Tensile tests are conducted on composite samples to verify this approach. When the effective material properties are used to characterize the deflections of composite beams subjected to pure bending, an excellent agreement is obtained. Laminated composite plate theory is investigated as a means for analyzing even more complex composites, consisting of multiple graphite layers oriented in different directions. In this case, composite beams are analyzed using the laminated composite plate theory with material properties established from tensile tests. Then, finite element modeling is used to verify the results. Considering the complexity of the samples, a very good agreement is obtained.

TM—2002–211546 February 2002

Artificial Aging Effects on Cryogenic Fracture Toughness of the Main Structural Alloy for the Super Lightweight Tank. P.S. Chen* and W.P. Stanton. Materials, Processes, and Manufacturing Department, Engineering Directorate and *IIT Research Institute.

In 1996, Marshall Space Flight Center developed a multistep heating rate-controlled (MSRC) aging technique that significantly enhanced cryogenic fracture toughness (CFT) and reduced the statistical spread of fracture toughness values in alloy 2195 by controlling the location and size of strengthening precipitate $T_1$. However, it could not be readily applied to flight-related hardware production, primarily because large-scale production furnaces are unable to maintain a heating rate of 0.6 °C (1 °F)/hr. In August 1996, a new program was initiated to determine whether the MSRC aging treatment could be further modified to facilitate its implementation to flight hardware production. It was successfully redesigned into a simplified two-step aging treatment consisting of 132 °C (270 °F)/20 hr + 138 °C (280 °F)/40 hr. Results indicated that two-step aging can achieve the same yield strength levels as those produced by conventional aging while providing greatly improved ductility. Two-step aging proved to be very effective at enhancing CFT, enabling previously rejected materials to meet simulated service requirements. Cryogenic properties are improved by controlling $T_1$ nucleation and growth so that they are promoted in the matrix and suppressed in the subgrain boundaries.

TM—2002–211547 February 2002

Cryogenic Fracture Toughness Improvement for the Super Lightweight Tank's Main Structural Alloy. P.S. Chen* and W.P. Stanton. Materials, Processes, and Manufacturing Department, Engineering Directorate and *IIT Research Institute.

Marshall Space Flight Center has developed a two-step (TS) artificial aging technique that can significantly enhance cryogenic fracture toughness and resistance to stress corrosion cracking (SCC) in aluminum-copper-lithium alloy 2195. The new TS aging treatment consists of exposures at 132 °C (270 °F)/20 hr + 138 °C (280 °F)/42 hr, which can be readily applied to flight hardware production. TS aging achieves the same yield strength levels as conventional aging, while providing much improved ductility in the short transverse direction. After TS aging, five previously rejected lots of alloy 2195 (lots 950M029B, 960M030F, 960M030J, 960M030K, and 960M030L) passed simulated service testing for use in the super lightweight tank program. Each lot exhibited higher fracture toughness at cryogenic temperature than at ambient temperature. Their SCC resistance was also enhanced. All SCC specimens passed the minimum 10-day requirement in 3.5-percent sodium chloride alternate immersion at a stress of

45 ksi. The SCC lives ranged from 57 to 83 days, with an average of 70 days.

TM—2002–211548 February 2002

Time-Temperature-Precipitation Behavior in Al-Li Alloy 2195. P.S. Chen* and B.N. Bhat. Materials, Processes, and Manufacturing Department, Engineering Directorate and *IIT Research Institute.

Transmission electron microscopy was used to study time-temperature-precipitation (TTP) behavior in aluminum-lithium (Al-Li) 2195 alloy. Al-Li 2195 (nominally Al + 4 percent Cu + 1 percent Li + 0.3 percent Ag + 0.3 percent Mg + 0.1 percent Zr) was initially solutionized for 1 hr at 950 °F and then stretched 3 percent. Heat treatments were conducted for up to 100 hr at temperatures ranging from 200 to 1,000 °F. TTP diagrams were determined for both matrix and subgrain boundaries. Depending upon heat treatment conditions, precipitate phases (such as *GP* zone, θ", θ', θ, δ', $T_1$, $T_B$, and $T_2$) were found in the alloy. The TTP diagrams were applied as a guide to avoid $T_1$ precipitation at subgrain boundaries, as part of an effort to improve the alloy's cryogenic fracture toughness (CFT). New understanding of TTP behavior was instrumental in the development of a two-step artificial aging treatment that significantly enhanced CFT in Al-Li 2195.

TM—2002–211626 March 2002

J.E. Turner Waits, Compiler. Information Services Department, Center Operations Directorate.

This Technical Memorandum (TM) presents formal NASA technical reports, papers published in technical journals, and presentations by MSFC personnel in FY 2001. It also includes papers of MSFC contractors.

After being announced in STAR, all NASA series reports may be obtained from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

The information in this TM may be of value to the scientific and engineering community in determining what information has been published and what is available.

TM—2002–211782 June 2002

Science Directorate Publications and Presentations, January 1–December 31, 2001. F.G. Summers, Compiler. Science Directorate.

This Technical Memorandum lists the significant publications and presentations of the Science Directorate during the period January 1–December 31, 2001. Entries in the main part of the document are categorized according to NASA Reports (arranged by report number), Open Literature, and Presentations (arranged alphabetically by title). Most of the articles listed under Open Literature have appeared in refereed professional journals, books, monographs, or conference proceedings. Although many published abstracts are eventually expanded into full papers for publication in scientific and technical journals, they are often sufficiently comprehensive to include the significant results of the research reported. Therefore, published abstracts are listed separately in a section under Open Literature. Questions or requests for additional information about the entries in this report should be directed to Ann F. Whitaker (SD01; (256) 544–2481) or to one of the authors.

TM—2002–211786 June 2002

NASA Marshall Engineering Thermosphere Model–Version 2.0. J.K. Owens. Space Science Department, Science Directorate.

This Technical Memorandum describes the NASA Marshall Engineering Thermosphere Model–Version 2.0 (MET–V 2.0) and contains an explanation on the use of the computer program along with an example of the MET–V 2.0 model products. The MET–V 2.0 provides an update to the 1988 version of the model. It provides information on the total mass density, temperature, and individual species number densities for any altitude between 90 and 2,500 km as a function of latitude, longitude, time, and solar and geomagnetic activity. A description is given for use of estimated future 13-mo smoothed solar flux and geomagnetic index values as input to the model.

Address technical questions on the MET–V 2.0 and associated computer program to Jerry K. Owens, Spaceflight Experiments Group, Marshall Space Flight Center, Huntsville, AL 35812 (256–961–7576; e-mail Jerry.Owens@msfc.nasa.gov).

TM—2002–211787 June 2002

Promoted Combustion Test Propagation Rate Data. J. Borstorff,* P. Jones,** and F. Lowery. Materials and Processes Laboratory, Science and Engineering Directorate; *Summer Faculty Fellow Accompanying Student, Auburn University; and **Summer Faculty Fellow, Auburn University.

Combustion propagation rate data were examined for potential use in benchmarking a thermal model of the Promoted Combustion Test (PCT), and also for potential use in measuring the repeatability of PCT results.

TM—2002–211917 August 2002

Test Platform for Advanced Digital Control of Brushless DC Motors (MSFC Center Director's Discretionary Fund Final Report, Project No. 00–04). D.A. Gwaltney. Avionics Department, Engineering Directorate

A FY 2001 Center Director's Discretionary Fund task to develop a test platform for the development, implementation, and evaluation of adaptive and other advanced control techniques for brushless DC (BLDC) motor-driven mechanisms is described. Important applications for BLDC motor-driven mechanisms are the translation of specimens in microgravity experiments and electromechanical actuation of nozzle and fuel valves in propulsion systems. Motor-driven aerocontrol surfaces are also being utilized in developmental X vehicles. The experimental test platform employs a linear translation stage that is mounted vertically and driven by a BLDC motor. Control approaches are implemented on a digital signal processor-based controller for real-time, closed-loop control of the stage carriage position. The goal of the effort is to explore the application of advanced control approaches that can enhance the performance of a motor-driven actuator over the performance obtained using linear control approaches with fixed gains. Adaptive controllers utilizing an exact model knowledge controller and a self-tuning controller are implemented and the control system performance is illustrated through the presentation of experimental results.

TM—2002–212047 September 2002

X–38 Bolt Retractor Subsystem Separation Demonstration. A.S. Johnston, R. Ahmed, J.C. Garrison, J.L. Gaines, and J.D. Waggoner. Simulation Group, Orbital Simulation Team.

The Flight Robotics Laboratory (FRL) successfully demonstrated the X–38 bolt retractor subsystem (BRS). The BRS design was proven safe by testing in the Pyrotechnic Shock Facility (PSF) before being demonstrated in the FRL. This Technical Memorandum describes the BRS, FRL, PSF, and interface hardware. Bolt retraction time, spacecraft simulator acceleration, and a force analysis are also presented. The purpose of the demonstration was to show the FRL capability for spacecraft separation testing using pyrotechnics. Although a formal test was not performed due to schedule and budget constraints, the data will show that the BRS is a successful design concept and the FRL is suitable for future separation tests.

TP—2001–211274 October 2001

Prospects for Nuclear Electric Propulsion Using Closed-Cycle Magnetohydrodynamic Energy Conversion. R.J. Litchford, L.J. Bitteker, and J.E. Jones. Advanced Space Transportation Program, Space Transportation Directorate.

Nuclear electric propulsion (NEP) has long been recognized as a major enabling technology for scientific and human exploration of the solar system, and it may conceivably form the basis of a cost-effective space transportation system suitable for space commerce. The chief technical obstacles to realizing this vision are the development of efficient, high-power (megawatt-class) electric thrusters and the development of low specific mass (<1 $kg/kW_e$) power plants. Furthermore, comprehensive system analyses of multimegawatt class NEP systems are needed in order to critically assess mission capability and cost attributes. This Technical Publication addresses some of these concerns through a systematic examination of multimegawatt space power installations in which a gas-cooled nuclear reactor is used to drive a magnetohydrodynamic (MHD) generator in a closed-loop Brayton cycle. The primary motivation for considering MHD energy conversion is the ability to transfer energy out of a gas that is simply too hot for contact with any solid material. This has several intrinsic advantages including the ability to achieve high thermal efficiency and power density and the ability to reject heat at elevated temperatures. These attributes lead to a reduction in system specific mass below that obtainable with turbine-based systems, which have definite solid temperature limits for reliable operation. Here, the results of a thermodynamic cycle analysis are placed in context with a preliminary system analysis in order to converge on a design space that optimizes performance while remaining clearly within established bounds of engineering feasibility. MHD technology issues are discussed including the conceptual design of a nonequilibrium disk generator and opportunities for exploiting neutron-induced ionization mechanisms as a means of increasing electrical conductivity and enhancing performance and reliability. The results are then used to make a cursory examination of piloted Mars missions during the 2018 opportunity.

TP—2001–211302 October 2001

Polymer Matrix Composite Lines and Ducts (National Research Announcement 8–21 Final Report). A.T. Nettles. Materials, Processes, and Manufacturing Department, Engineering Directorate.

Since composite laminates are beginning to be identified for use in reusable launch vehicle propulsion systems, a task was undertaken to assess the feasibility of making cryogenic feedlines with integral flanges from polymer matrix composite materials. An additional level of complexity was added by having the feedlines be elbow shaped. Four materials, each with a unique manufacturing method, were chosen for this program. Feedlines were to be made by hand layup (HLU) with standard autoclave cure, HLU with electron beam cure, solvent-assisted resin transfer molding (SARTM), and thermoplastic tape laying (TTL). A test matrix of fill and drain cycles with both liquid nitrogen and liquid helium, along with a heat up to 250 °F, was planned for each of the feedlines. A pressurization to failure was performed on any feedlines that passed the cryogenic cycling testing. A damage tolerance subtask was also undertaken in this study. The effects of foreign object impact to the materials used was assessed by cross-sectional examination and by permeability after impact testing. At the end of the program, the manufacture of the electron beam-cured feedlines never came to fruition. All of the TTL feedlines leaked heavily before any cryogenic testing; all of the SARTM feedlines leaked heavily after one cryogenic cycle. Thus, only the HLU with autoclave cure feedlines underwent the complete test matrix. They passed the cyclic testing and were pressurized to failure.

TP—2001–211331 October 2001

System Simulation by Recursive Feedback: Coupling a Set of Stand-Alone Subsystem Simulations. D.D. Nixon. Vehicle and System Development Department, Space Transportation Directorate.

Conventional construction of digital dynamic system simulations often involves collecting differential equations that model each subsystem, arranging them to a standard form, and obtaining their numerical solution as a single coupled, total-system simultaneous set. Simulation by numerical coupling of independent stand-alone subsimulations is a fundamentally different approach that is attractive because, among other things, the architecture naturally facilitates high fidelity, broad scope, and discipline independence. Recursive feedback is defined and discussed as a candidate approach to multidiscipline dynamic system simulation by numerical coupling of self-contained, single-discipline subsystem simulations. A satellite motion example containing three subsystems (orbit dynamics, attitude dynamics, and aerodynamics) has been defined and constructed using this approach. Conventional solution methods are used in the subsystem simulations. Distributed and centralized implementations of coupling have been considered. Numerical results are evaluated by direct comparison with a standard total-system, simultaneous-solution approach.

TP—2001–211412 December 2001

Development of a Gas-Fed Pulse Detonation Research Engine. R.J. Litchford. Advanced Space Transportation Program, Space Transportation Directorate.

In response to the growing need for empirical data on pulse detonation engine performance and operation, NASA Marshall Space Flight Center has developed and placed into operation a low-cost, gas-fed pulse detonation research engine. The guiding design strategy was to achieve a simple and flexible research apparatus, which was inexpensive to build and operate. As such, the engine was designed to operate as a heat sink device, and testing was limited to burst-mode operation with run durations of a few seconds. Wherever possible, maximum use was made of standard off-the-shelf industrial or automotive components. The 5-cm-diameter primary tube is about 90 cm long and has been outfitted with a multitude of sensor and optical ports. The primary tube is fed by a coaxial injector through an initiator tube, which is inserted directly into the injector head face. Four auxiliary coaxial injectors are also integrated into the injector head assembly. All propellant flow is controlled with industrial solenoid valves. An automotive electronic ignition system was adapted for use, and spark plugs are mounted in both tubes so that a variety of ignition schemes can be examined. A microprocessor-based fiber-optic engine control system was developed to provide precise control over valve and ignition timing. Initial shakedown testing with hydrogen/oxygen mixtures verified the need for Schelkin spirals in both the initiator and primary tubes to ensure rapid development of the detonation wave. Measured pressure wave time-of-flight indicated detonation velocities of 2.4 km/s and 2.2 km/s in the initiator and primary tubes, respectively. These values implied a fuel-lean mixture corresponding to an $H_2$ volume fraction near 0.5. The axial distribution for the detonation velocity was found to be essentially constant along the primary tube. Time-resolved thrust profiles were also acquired for both underfilled and overfilled tube conditions. These profiles are consistent with previous time-resolved measurements on single-cycle tubes where the thrust is found to peak as the detonation wave exits the tube, and decay as the tube blows down.

TP—2002–211464 January 2002

High-Purity Aluminum Magnet Technology for Advanced Space Transportation Systems. R.G. Goodrich,* B. Pullam,** D. Rickle,*** R.J. Litchford, G.A. Robertson, and D.D. Schmidt. Advanced Space Transportation Program, Space Transportation Directorate; *Department of Physics and Astronomy, Louisiana State University; **National High Magnetic Field Laboratory, Florida State University; and ***National High Magnetic Field Laboratory, Los Alamos National Laboratory.

Basic research on advanced plasma-based propulsion systems is routinely focused on plasmadynamics, performance, and efficiency aspects while relegating the development of critical enabling technologies, such as flight-weight magnets, to follow-on development work. Unfortunately, the low technology readiness levels (TRLs) associated with critical enabling technologies tend to be perceived as an indicator of high technical risk, and this, in turn, hampers the acceptance of advanced system architectures for flight development. Consequently, there is growing recognition that applied research on the critical enabling technologies needs to be conducted hand in hand with basic research activities. The development of flight-weight magnet technology, for example, is one area of applied research having broad crosscutting applications to a number of advanced propulsion system architectures. Therefore, NASA Marshall Space Flight Center, Louisiana State University (LSU), and the National High Magnetic Field Laboratory (NHMFL) have initiated an applied research project aimed at advancing the TRL of flight-weight magnets. This Technical Publication reports on the group's initial effort to demonstrate the feasibility of cryogenic high-purity aluminum magnet technology and describes the design, construction, and testing of a 6-in-diameter by 12-in-long aluminum solenoid magnet. The coil was constructed in the machine shop of the Department of Physics and Astronomy at LSU and testing was conducted in NHMFL facilities at Florida State University and at Los Alamos National Laboratory. The solenoid magnet was first wound, reinforced, potted in high thermal conductivity epoxy, and bench tested in the LSU laboratories. A cryogenic container for operation at 77 K was also constructed and mated to the solenoid. The coil was then taken to NHMFL facilities in Tallahassee, FL, where its magneto resistance was measured in a 77 K environment under steady magnetic fields as high as 10 T. In addition, the temperature dependence of the coil's resistance was measured from 77 to 300 K. Following this series of tests, the coil was transported to NHMFL facilities in Los Alamos, NM, and pulsed to 2 T using an existing capacitor bank pulse generator. The coil was completely successful in producing the desired field without damage to the windings.

TP—2002–211729 May 2002

Development of Advanced Hydrocarbon Fuels at Marshall Space Flight Center. S.D. Bai, P. Dumbacher, and J.W. Cole. Space Transportation Directorate.

This was a small-scale, hot-fire test series to make initial measurements of performance differences of five new liquid fuels relative to rocket propellant–1 (RP–1). The program was part of a high-energy-density materials development at Marshall Space Flight Center (MSFC), and the fuels tested were quadricyclane, 1–7 octadiyne, AFRL–1, biclopropylidene, and competitive impulse noncarcinogenic hypergol (CINCH) (di-methyl-aminoethyl-azide). All tests were conducted at MSFC. The first four fuels were provided by the U.S. Air Force Research Laboratory (AFRL), Edwards Air Force Base, CA. The U.S. Army, Redstone Arsenal, Huntsville, AL, provided the CINCH. The data recorded in all hot-fire tests were used to calculate specific impulse and characteristic

exhaust velocity for each fuel, then compared to RP–1 at the same conditions. This was not an exhaustive study, comparing each fuel to RP–1 at an array of mixture ratios, nor did it include important fuel parameters, such as fuel handling or long-term storage. The test hardware was designed for liquid oxygen (lox)/ RP–1, then modified for gaseous oxygen/RP–1 to avoid two-phase lox at very small flow rates. All fuels were tested using the same thruster/injector combination designed for RP–1. The results of this test will be used to determine which fuels will be tested in future test programs.

TP—2002–212020 September 2002

Statistical Properties of Maximum Likelihood Estimators of Power Law Spectra Information. L.W. Howell. Space Science Department, Science Directorate.

A simple power law model consisting of a single spectral index, $\alpha_1$, is believed to be an adequate description of the galactic cosmic-ray (GCR) proton flux at energies below $10^{13}$ eV, with a transition at the knee energy, $E_k$, to a steeper spectral index $\alpha_2 > \alpha_1$ above $E_k$. The maximum likelihood (ML) procedure was developed for estimating the single parameter $\alpha_1$ of a simple power law energy spectrum and generalized to estimate the three spectral parameters of the broken power law energy spectrum from simulated detector responses and real cosmic-ray data. The statistical properties of the ML estimator were investigated and shown to have the three desirable properties: (P1) consistency (asymptotically unbiased), (P2) efficiency (asymptotically attains the Cramer-Rao minimum variance bound), and (P3) asymptotically normally distributed, under a wide range of potential detector response functions. Attainment of these properties necessarily implies that the ML estimation procedure provides the best unbiased estimator possible.

While simulation studies can easily determine if a given estimation procedure provides an unbiased estimate of the spectra information, and whether or not the estimator is approximately normally distributed, attainment of the Cramer-Rao bound (CRB) can only be ascertained by calculating the CRB for an assumed energy spectrum-detector response function combination, which can be quite formidable in practice. However, the effort in calculating the CRB is very worthwhile because it provides the necessary means to compare the efficiency of competing estimation techniques and, furthermore, provides a stopping rule in the search for the best unbiased estimator. Consequently, the CRB for both the simple and broken power law energy spectra are derived herein and the conditions under which they are attained in practice are investigated.

The ML technique is then extended to estimate spectra information from an arbitrary number of astrophysics data sets produced by vastly different science instruments. This theory and its successful implementation will facilitate the interpretation of spectral information from multiple astrophysics missions and thereby permit the derivation of superior spectral parameter estimates based on the combination of data sets.

CP—2002–211466 February 2002

The 2001 NASA Aerospace Battery Workshop. J.C. Brewer, Compiler. Avionics Department.

This document contains the proceedings of the 34th annual NASA Aerospace Battery Workshop, hosted by Marshall Space Flight Center, November 27–29, 2001. The workshop was attended by scientists and engineers from various agencies of the U.S. Government, aerospace contractors, and battery manufacturers, as well as international participation in like kind.

The subjects covered included nickel-hydrogen, nickel-cadmium, lithium-ion, and silver-zinc technologies.

CP—2002–211783 July 2002

The 12th Thermal and Fluids Analysis Workshop. A. Majumdar, Compiler. Structures, Mechanics, and Thermal Department, Engineering Directorate.

The 12th Thermal and Fluids Analysis Workshop (TFAWS 01) was held at the Bevill Center, The University of Alabama in Huntsville, Huntsville, AL, September 10–14, 2001. The theme for the hands-on training workshop and conference was "Engineering Excellence and Advances in the New Millennium." Forty-five technical papers were presented in four sessions: (1) Thermal Spacecraft/Payloads, (2) Thermal Propulsion/Vehicles, (3) Interdisciplinary Papers, and (4) Fluids Papers. Thirty-nine papers were published in these proceedings. The remaining six papers were not available in the electronic format at the time of publication. In addition to the technical papers, there were (a) 9 hands-on classes on thermal and flow analyses softwares, (b) 13 short courses and product overview lectures, (c) 5 keynote lectures and, (d) panel discussions consisting of 8 presentations. The workshop resulted in participation of 195 persons representing NASA Centers, Government agencies, aerospace industries, academia, software providers, and private corporations.

CR—2001–211411 December 2001

Testing and Optimization of Electrically Conductive Spacecraft Coatings. R.J. Mell* and G.E. Wertz. NASA's Space Environments and Effects Program and *AZ Technology, Inc.

This is the final report discussing the work done for the Space Environments and Effects (SEE) Program. It discusses test chamber design, coating research, and test results on electrically thermal control coatings. These thermal control coatings are being developed to have several orders of magnitude higher electrical conductivity than most available thermal control coatings. Most current coatings tend to have a range in surface resistivity from 1,011 to 1,013 ohms/sq.

Historically, spacecraft have had thermal control surfaces composed of dielectric materials of either polymers (paints and metalized films) or glasses (ceramic paints and optical solar reflectors). Very seldom has the thermal control surface of a spacecraft been a metal where the surface would be intrinsically electrically conductive. The poor thermal optical properties of most metals have, in most cases, stopped them from being used as a thermal control surface. Metals' low infrared emittance (generally considered poor for thermal control surfaces) and/or solar absorbance have resulted in the use of various dielectric coatings or films being applied over the substrate materials in order to obtain the required optical properties.

CR—2002–211730 June 2002

The Interstellar Probe (ISP): Pre-Perihelion Trajectories and Application of Holography. G.L. Matloff,* G. Vulpetti,** C. Bangs,*** and R. Haggerty.* Space Transportation Directorate, *Pace University, **Telespazio Company, and ***Art Resource Transfer, Inc.

Between February and September 2001, a number of aspects of the solar-sail-launched Interstellar Probe (ISP), which is under consideration by NASA for launch in the 2010–2015 timeframe, were researched. The effort was conducted in New York City (NYC) February–May, at Marshall Space Flight Center (MSFC) May–July (when the Principal Investigator served as a NASA Summer 2001 Faculty Fellow), and in NYC August–September. In addition to the people listed on the title sheet, many people in NYC and at MSFC participated in this research.

CR—2002–211784 June 2002

Space Environments and Effects: Trapped Proton Model. S.L. Huston.* NASA's Space Environments and Effects Program and *The Boeing Company.

An improved model of the Earth's trapped proton environment has been developed. This model designated Trapped Proton Model version 1 (TPM–1), determines the omnidirectional flux of protons with energy between 1 and 100 MeV throughout near-Earth space. The model also incorporates a true solar cycle dependence. The model consists of several data files and computer software to read them. There are three versions of the model: a FORTRAN-Callable library, a stand-alone model, and a Web-based model.

CR—2002–211785 June 2002

Development of a Spacecraft Materials Selector Expert System. G. Pippin.* NASA's Space Environment and Effects Program and *The Boeing Company.

This report contains a description of the knowledge base tool and examples of its use. A downloadable version of the Spacecraft Materials Selector (SMS) knowledge base is available through the NASA Space Environments and Effects Program. The "Spacecraft Materials Selector" knowledge base is part of an electronic expert system. The expert system consists of an inference engine that contains the "decision-making" code and the knowledge base that contains the selected body of information. The inference engine is a software package previously developed at Boeing, called the Boeing Expert System Tool (BEST) kit.

CR—2002–211839 July 2002

SEE Design Guide and Requirements for Electrical Deadfacing. J.M. Berki and N.B. Sargent. NASA's Space Environments and Effects Program.

The purpose of this design guide is to present information for understanding and mitigating the potential hazards associated with the de-mating and mating powered electrical connectors on space flight vehicles. The process of staging is a necessary function in the launching of space vehicles and in the deployment of satellites, and now in manned assembly of systems in space. During this electrical interconnection process, various environments may be encountered that warrant the restriction of the voltage and current present across the pins of an electrical connector prior to separation, mating, or in a static open nonmated configuration. This process is called deadfacing. These potentially hazardous environments encompass the obvious explosive fuel vapors and human shock hazard, to multiple electromagnetic interference phenomena related to the rapid rate of change in current as well as exposure to radio frequency fields.

CR—2002–211840 July 2002

Research Reports—2001 NASA/ASEE Summer Faculty Fellowship Program. J. Bland, Compiler; G. Karr,* J. Pruitt, S. Nash-Stevenson, L.M. Freeman,** and C.L. Karr,** Editors. *The University of Alabama in Huntsville, Huntsville AL; **The University of Alabama, Tuscaloosa, AL; and Education Programs Department, Customer and Employee Relations Directorate.

For the 37th consecutive year, a NASA/ASEE Summer Faculty Fellowship Program was conducted at Marshall Space Flight Center (MSFC). The program was conducted by The University of Alabama in Huntsville and MSFC during the period May 29–August 3, 2001. Operated under the auspices of the American Society for Engineering Education, the MSFC program, as well as those at other NASA Centers, was sponsored by the University Affairs Office, NASA Headquarters, Washington, DC. The basic objectives of the programs, which are in the 37th year of operation nationally, are (1) to further the professional knowledge of qualified engineering and science faculty members, (2) to stimulate an exchange of ideas between participants and NASA, (3) to enrich and refresh the research and teaching activities of the participants' institutions, and (4) to contribute to the research objectives of the NASA Centers. The Faculty Fellows spent 10 weeks at MSFC engaged in a research project compatible with their interests and background and worked in collaboration with a NASA MSFC colleague. This document is a compilation of Fellows' reports on their research during the summer of 2001.

ABBAS, M.M. SD50
CRAVEN, P.D. SD50
SPANN, J.F. SD50
TANKOSIC, D. UAH
Laboratory Studies of the Optical Properties and Condensation Processes of Cosmic Dust Particles—Abstract Only. For presentation at the NASA Laboratory Astrophysics Workshop, San Jose, CA, May 1–3, 2002.

ABBAS, M.M. SD50
CRAVEN, P.D. SD50
SPANN, J.F. SD50
WEST, E.A. SD50
PRATICO, J. UAH
TANKOSIC, D. UAH
VENTURINI, C.C. Aerospace Corp.
Photoemission Experiments for Charge Characteristics of Individual Dust Grains—Abstract Only. For publication in Physica Scripta, 2002.

ABEDIAN, B. Tufts University
HYERS, R.W. SD46
Spinup Instability of a Levitated Molten Drop in MHD-Flow Transition to Turbulence—Abstract Only. For presentation at the Progress in Electromagnetics Research Symposium, Cambridge, MA, July 1–5, 2002.

ACHARI, A. Raytheon
ROEBER, D.F. USRA
BARNES, C.L. USRA
KUNDROT, C.E. SD41
Equilibrium Kinetics Studies and Crystallization Aboard the *International Space Station* (*ISS*) Using the Protein Crystallization Apparatus for Microgravity (PCAM)—Abstract Only. For presentation at the American Crystallographic Association Annual Meeting, San Antonio, TX, May 25–30, 2002.

ADAMS, J.H., JR. SD50
The Extreme Universe Space Observatory—Abstract Only. For presentation at and publication in the April Meeting Bulletin of The American Physical Society, Albuquerque, NM, April 20–23, 2002.

ADAMS, M.L. SD50
The Sun—Our Nearest Star—Abstract Only. For presentation at the 91st Spring Meeting of the AAVSO and The High-Energy Astrophysics Workshop for Amateur Astronomers, Waikoloa, HI, June 30–July 6, 2002.

ADAMS, R.B. TD30
POLSGROVE, T.T. TD30
Mission Analysis for High Specific Impulse Deep Space Exploration. For presentation at the 28th International Electric Propulsion Conference, Toulouse, France, March 17–21, 2003.

ADRIAN, M.L. SD50
Global Plasmaspheric Imaging—A New "Light" Focusing on Familiar Questions—Abstract Only. For presentation at the UAH Physics Department Seminar, Huntsville, AL, January 22, 2002.

ADRIAN, M.L. SD50
NASA/Marshall Space Flight Center's Contributions to Space Plasma Physics—Abstract Only. For presentation at the Meeting of the Southeast Section of The American Physical Society, Auburn, AL, October 31–November 1, 2002.

ADRIAN, M.L. SD50
GALLAGHER, D.L. SD50
GREEN, J.L. Goddard Space Flight Center
SANDEL, B.R. University of Arizona
Plasmaspheric Density Troughs: Global IMAGE EUV Observations and Analysis via Global Core Plasma Modeling—Abstract Only. For presentation at the Magnetospheric Imaging Workshop, Yosemite National Park, CA, February 5–8, 2002.

ADRIAN, M.L. SD50
GALLAGHER, D.L. SD50
KHAZANOV, G.V. SD50
CHANG, S.-W. SD50
LIEMOHN, M.W. University of Michigan
PEREZ, J.D. Auburn University
GREEN, J.L. Goddard Space Flight Center
SANDEL, B.R. University of Arizona
MITCHELL, D.G. Johns Hopkins University
MENDE, S.B. University of CA, Berkeley
Plasmaspheric Erosion via Plasmasphere Coupling to Ring Current Plasmas: EUV Observations and Modeling—Abstract Only. For presentation and publication in the Proceedings of the American Geophysical Union Spring Meeting, Washington, DC, May 28–31, 2002.

AHN, H.S. University of Maryland
CASE, G. Louisiana State University
ADAMS, J.H., JR. SD50
CHRISTL, M.J. SD50
FAZELY, R. Southern University
HAN, Y.J. Seoul National University
BASHINDZHAGYAN, G.L. Moscow State University
CHANG, J. Max-Planck-Institut für Aeronomie
ET AL.
Advanced Thin Ionization Calorimeter (ATIC) Update—Abstract Only. For presentation at and publication in the

April Meeting Bulletin of The American Physical Society, Albuquerque, NM, April 20–23, 2002.

ANTAR, B.N. UTSI
ETHRIDGE, E.C. SD46
MAXWELL, D. UTSI
Viscosity Measurement Using Drop Coalescence in Microgravity—Abstract Only. For publication in Microgravity—Science and Technology, 2002.

ANTAR, B.N. UTSI
PALEY, M.S. SD46
WITHEROW, W.K. SD46
Experimental and Numerical Investigation of Buoyancy-Driven Convection During PDAMNA Thin Film Growth—Abstract Only. For publication in the Journal of Crystal Growth, 2001.

AVANOV, L.A. SD50
CHANDLER, M.O. SD50
SMIRNOV, V.N. SD50
VAISBERG, O.L. SD50
Decelerated Magnetosheath Plasma Flow at High Latitudes Behind the Cusp Region: Interball Tail Observations—Abstract Only. For presentation at the American Geophysical Union Fall Meeting, San Francisco, CA, December 6–10, 2002.

BABAI, M.K. ED34
PHILLIPS, S. ED34
GRIFFIN, B. ED34
Manufacturing Process Simulation of Large-Scale Cryotanks—Abstract Only. For presentation at the 5th Aerospace Materials, Processes, and Environmental Technology Conference, Huntsville, AL, September 16–18, 2002.

BACSKAY, A.S. FD31
Expedite the Processing of Unpressurized Payloads to the *International Space Station* Using the ExPRESS Pallet—Abstract Only. For presentation at the 53rd International Astronautical Congress of the International Astronautical Federation/The World Space Congress, Houston, TX, October 10–19, 2002.

BAILEY, M.D. UP20
CRUMBLY, C. ED20
NASA Alternate Access to Station Service Concept—Abstract Only. For presentation at the 53rd International Astronautical Congress of the International Astronautical Federation/The World Space Congress, Houston, TX, October 10–19, 2002.

BAILEY, M.D. ED20
DANIEL, C.
Options and Risk for Qualification of Electric Propulsion System—Abstract Only. For presentation at the 28th International Electric Propulsion Conference, Toulouse, France, March 17–21, 2003.

BALLARD, G. Dynamic Concepts, Inc.
HOWSMAN, T. Dynamic Concepts, Inc.
CRAFT, M. Dynamic Concepts, Inc.
O'NEIL, D.A. FD02
STEINCAMP, J.W. FD02
Evolutionary Design of a Robotic Material Defect Detection System. For presentation at The Huntsville Simulation Conference, Huntsville, AL, October 9–10, 2002.

BANKS, C.E. SD46
FRAZIER, D.O. SD46
PENN, B.G. SD46
ABDELDAYEM, H. SD46
SHARMA, A. Alabama A&M University
YELLESWARAPU, C. Alabama A&M University
LEYDERMAN, A. University of Puerto Rico
CORREA, M. University of Puerto Rico
Fabry-Perot Interferometer-Based Electrooptic Modulator Using $LiNbO_3$ and Organic Thin Films—Abstract Only. For presentation at the 5th International Conference on Application of Photonic Technology, Quebec, Canada, June 2–6, 2002.

BANKS, C.E. Alabama A&M University
YELLESWARAPU, C. Alabama A&M University
SHARMA, A. Alabama A&M University
FRAZIER, D.O. SD46
PENN, B.G. SD46
ABDELDAYEM, H. SD46
Design and Fabrication of a Fabry-Perot Electrooptic Modulator—Abstract Only. For presentation at the Alliance for Nonlinear Optics Conference, El Paso, TX, November 2, 2001.

BASHINDZHAGYAN, G.L. Moscow State University
ADAMS, J.H., JR. SD50
BASHINDZHAGYAN, P. Moscow State University
CHILINGARIAN, A. Yerevan Physics Institute
ET AL.
First Accelerator Test of the Kinematic Lightweight Energy Meter (KLEM) Prototype—Abstract Only. For publication in Nuclear Instruments and Methods, 2002.

BATKOV, K.E. Moscow State University
ADAMS, J.H., JR. SD50
AHN, H.S. University of Maryland
BASHINDZHAGYAN, G.L. Moscow State University
CASE, G. Louisiana State University
Simulation of Energy Response of the ATIC Calorimeter—Abstract Only. For publication in the Proceedings of European Cosmic Ray Conference, 2002.

BERRY, S. MIT
HYERS, R.W. SD46
RACZ, L.M. Axsun Technologies
ABEDIAN, B. Tufts University
Surface Oscillations of an Electromagnetically Levitated Droplet—Abstract Only. For publication in the International Journal of Thermophysics, 2002.

BEST, S.B. FD41
BRADFORD, B. FD41
CHAMBERLAIN, J. FD41
NICHOLS, K.F. FD41
Internet Voice Distribution System (IVoDS) Utilization in Remote Payload Operations—Abstract Only. For presentation at the Space Ops 2002 Conference/The World Space Congress, Houston, TX, October 9–19.

BHARDWAJ, A. Vikram Sarabhai Space Center
GLADSTONE, G.R. SwRI
ELSNER, R.F. SD50
WAITE, J.H., JR. University of Michigan
GRODENT, D.C. University of Liege
CRAVENS, T.E. University of Kansas
WEISSKOPF, M.C. SD50
FENNANT, A.F. SD50
ET AL.
Soft X-Ray Emissions From Planets and Moons—Abstract Only. For presentation at and publication in the Proceedings of the ESLAB 36 Earth-Like Planets and Moons Symposium, Noordwijk, the Netherlands, June 3–8, 2002.

BHAT, B.N. ED33
Metal Matrix Composite Materials for Aerospace Applications—Abstract Only. For presentation at a Vanderbilt University Seminar, Nashville, TN, December 3, 2001.

BHAT, B.N. ED33
CARTER, R.W. ED33
DING, R.J. ED33
LAWLESS, K.G. ED33
NUNES, A.C., JR. ED33
RUSSELL, C.K. ED33
SHAH, S.R. ED33
Friction Stir Welding Development at NASA Marshall Space Flight Center. For publication in the Metallurgical Society Special Publication of Friction Stir Welding, Warrendale, PA, 2001.

BLAKESLEE, R.J. SD60
The Altus Cumulus Electrification Study (ACES): A UAV-Based Investigation of Thunderstorms—Abstract Only. For presentation at the TAAC Unmanned Aerial Vehicle Annual Symposium, Las Cruces, NM, October 29–31, 2001.

BLAKESLEE, R.J. SD60
MACH, D.M. UAH
DESCH, M.D. Goddard Space Flight Center
GOLDBERG, R.A. Goddard Space Flight Center
FARRELL, W.M. Goddard Space Flight Center
HOUSER, J.G. Goddard Space Flight Center
The Altus Cumulus Electrification Study (ACES): A UAV-Based Science Demonstration—Abstract Only. For presentation at the 1st AIAA Unmanned Aerospace Vehicles, Systems, Technologies, and Operations Conference and Workshop, Portsmouth, VA, May 20–22, 2002.

BOCCIPPIO, D.J. SD60
Determination of Storm Flashing/Non-Flashing Condition from Convective and Environmental Observations—Abstract Only. For presentation at and publication in the Proceedings of the American Geophysical Union Fall Meeting, San Francisco, CA, December 6–10, 2002.

BOCCIPPIO, D.J. SD60
HECKMAN, S.
RENNO, N.O.
CHRISTOPHER, P.
MILLTY, D.
The Influence of Environmental State on Lightning and Convective Parameter Distributions. For presentation at and publication in the Proceedings of the American Geophysical Union Fall Meeting, San Francisco, CA, December 6–10, 2002.

BOCCIPPIO, D.J. SD60
PETERSEN, W.A. UAH
CIFELLI, R.
RUTLEDGE, S.A.
Diurnal Cycle of Convection in the East Pacific ITCZ During EPIC–2001—Abstract Only. For presentation at and publication in the Proceedings of the American Meteorological Society 25th Conference on Hurricanes and Tropical Meteorology, San Diego, CA, April 29–May 3, 2002.

BONAMENTE, M. UAH
LIEU, R. UAH
JOY, M.K. SD50

A Giant Warm Baryonic Halo for the Coma Cluster—Abstract Only. For publication in Astrophysical Journal Letters, 2002.

BONAMENTE, M. UAH
LIEU, R. UAH
JOY, M.K. SD50
NEVALAINEN, J.H. UAH

The Soft X-Ray Emission in a Large Sample of Galaxy Clusters With ROSAT PSPC—Abstract Only. For publication in The Astrophysical Journal, 2002.

BOOTHE, R.E. ED31

Use of FT–IR Analysis To Support Contamination Studies for Bonding Surfaces—Abstract Only. For presentation at the 5th Aerospace Materials, Processes, and Environmental Technology Conference, Huntsville, AL, September 16–18, 2002.

BOUQUET, C. Snecma Propulsion
PICHON, T. Snecma Propulsion
LAITHIER, F. Snecma Moteurs
LAWRENCE, T.W. ED34
ECKEL, A. Glenn Research Center

Demonstration of Advanced C/SiC Cooled Ramp. For presentation at the Propulsion for Space Transportation of the XXIst Century Symposium, Versailles, France, May 14–16, 2002.

BRADFORD, R.N. FD40

An Analysis for the Use of Research and Education Networks and Commercial Network Vendors in Support of Space-Based Mission Critical and Non-Critical Networking—Abstract Only. For presentation at the 23rd International Symposium on Space Technology and Science, Matsue, Japan, May 26–June 2, 2002.

BRADFORD, R.N. FD40

An Analysis for an Internet Grid To Support Space-Based Operations—Abstract Only. For presentation at the Space Ops 2002 Conference/The World Space Congress, Houston, TX, October 10–19, 2002.

BRADFORD, R.N. FD40
REDMAN, S.H. UAH

A Grid Infrastructure for Supporting Space-Based Science Operations. For presentation at the Space Ops 2002 Conference/The World Space Congress, Houston, TX, October 10–19, 2002.

BREBRICK, R.F. Marquette University
SU, C.-H. SD47

Partial Pressures for In-Se From Optical Absorbance of the Vapor—Abstract Only. For publication in the Journal of Phase Equilibria, 2001.

BROWN, A.M. ED21

Temperature-Dependent Modal Test/Analysis Correlation of X–34 Fastrac Composite Rocket Nozzle. For publication in the AIAA Journal of Propulsion and Power, 2002.

BROWN, A.M. ED21
RUF, J.H. ED21
REED, D. ED21
D'AGOSTINO, M.G. ED21
KEANINI, R. University of North Carolina

Characterization of Side Load Phenomena Using Measurement of Fluid/Structure Interaction. For presentation at the 38th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, Indianapolis, IN, July 7–10, 2002.

BYBERG, A. SAIC
RUSSELL, J.K. SD70

Managing Risk on a Technology Development Project/ Advanced Mirror System Demonstrator—Abstract Only. For presentation at the Fourth National Symposium on Space System Risk Management, McLean, VA, May 21–24, 2002.

BYBERG, A. Pace & Waite, Inc.
RUSSELL, J.K. SD70
KAUKLER, D.K. SD70

AMSD Risk Management—Abstract Only. For presentation at the Fourth National Symposium on Space System Risk Management, McLean, VA, May 21–24, 2002.

CAMPBELL, J.W. FD02

Laser Prevention of Earth Impact Disasters—Abstract Only. For presentation at the 53rd International Astronautical Congress of the International Astronautical Federation/The World Space Congress, Houston, TX, October 10–19, 2002.

CAMPBELL, J.W. FD02
CARRUTH, R. ED30

STARSAT: A Joint NASA/AF Project for Laser Calibration of Small Objects in Space. For presentation at SPIE's High-Power Laser Ablation 2002 Conference, Taos, NM, April 21–26, 2002.

CANABAL, F.N. TD64
DORNEY, D.J. TD64
GARCIA, R. TD64
Steady and Unsteady Simulations of the Flow in an Impeller/Diffuser Stage. For presentation at the JANNAF 26th Airbreathing Propulsion Subcommittee Meeting, Destin, FL, April 8–12, 2002.

CANFIELD, S. Tennessee Technological University
JOHNSON, D.M. Tennessee Technological University
SORENSEN, K.F. TD40
WELZYN, K.J. TD15
A Model for Dynamic Simulation and Analysis of Tether Momentum Exchange. For publication in the Journal of the Astronautical Sciences, 2002.

CARRASQUILLO, R.L. FD21
OGLE, K.Y. FD21
HARRIS, D. Morgan Research Corporation
BERTOTTO, D. Alenia Spazio
Status of the *International Space Station* Nodes 2/3 Environmental Control and Life Support System. For presentation at the 32nd International Conference on Environmental Systems, San Antonio, TX, July 15–18, 2002.

CARRINGTON, C.K. FD02
FEINGOLD, H. SAIC
Space Solar Power Concepts: Demonstrations to Pilot Plants—Abstract Only. For presentation at the 53rd International Astronautical Congress of the International Astronautical Federation/The World Space Congress, Houston, TX, October 10–19, 2002.

CARROLL, C. Code S Headquarters
JOHNSON, L. TD15
BAGGETT, R.M. TD15
In-Space Propulsion Program Overview and Status—Abstract Only. For presentation at the 28th International Electric Propulsion Conference, Toulouse, France, March 17–21, 2003.

CARSWELL, W.E. UAH
FARMER, J.T. ED25
COPPENS, C.J. ED23
BREEDING, S.P. ED25
ROSE, F. Pace & Waite, Inc.
QMI: Rising to the Space Station Design Challenge—Abstract Only. For presentation at the *ISS* Utilization—Microgravity Environment/The World Space Congress, Houston, TX, October 10–19, 2002.

CASAS, J.C. SD10
NALL, M.E. SD10
POWERS, C.B. SD10
Commercial Research and Development: Power To Explore, Opportunities From Discovery—Abstract Only. For presentation at the 23rd International Symposium on Space Technology and Science, Matsue, Japan, May 26–June 2, 2002.

CASIANO, M.J. TD63
HAMIDZADEH, H.R. South Dakota State University
TINKER, M.L. ED21
Dynamics of a 4×6-Meter Thin Film Elliptical Inflated Membrane for Space Applications. For presentation at the 43rd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Denver, CO, April 22–25, 2002.

CASSIBRY, J.T. TD40
THIO, Y.C.F. TD40
MARKUSIC, T.E. TD40
SOMMER, J.C. TD40
Design of a Plasma Injector for a Pulsed Plasma Accelerator—Abstract Only. For presentation at The American Physical Society Division of Plasma Physics Annual Meeting, Orlando, FL, November 11–15, 2002.

CHAMBERLAIN, J. AZ Technology, Inc.
BRADFORD, B. FD40
BEST, S.B. FD41
NICHOLS, K.F. FD41
Utilization of Internet Protocol-Based Voice Systems in Remote Payload Operations. For presentation at The Space Ops 2002 Conference/The World Space Congress, Houston, TX, October 9–19, 2002.

CHAMPION, R.H., JR. TD20
On-Orbit Propulsion System Project Overview. For presentation at the 1st AIAA/IAF Symposium on Future Reusable Launch Vehicles, Huntsville, AL, April 11–12, 2002.

CHANDLER, F. Boeing
SCHEIERN, M. Boeing
CHAMPION, R.H., JR. TD20
MAZURKIVICH, P. TD20
Launch Vehicle Sizing Benefits Utilizing Main Propulsion System Crossfeed and Project Status. For presentation at the 38th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, Indianapolis, IN, July 7–10, 2002.

CHANG, H. UAH
GATES, A.L. UAH
FULLER, K.A. UAH
GREGORY, D.A. UAH
WITHEROW, W.K. SD46
PALEY, M.S. USRA
FRAZIER, D.O. SD46
SMITH, D.D. SD46

Slow Light in Coupled Resonator Optical Waveguides—Abstract Only. For presentation at the OSA Conference on Optics in the Southeast, Huntsville, AL, October 24–25, 2002.

CHANG, H. UAH
SMITH, D.D. SD46
FULLER, K.A. UAH

Enhancement of Optical Nonlinearities via Whispering Gallery Mode Splitting—Abstract Only. For presentation at and publication in the International Symposium on Optical Science and Technology, SPIE's 47th Annual Meeting, Seattle, WA, July 7–11, 2002.

CHANG, S.-W. SD50
MENDE, S. SD50
FREY, H.U. SD50
GALLAGHER, D.L. SD50
LEPPING, R.P. SD50

Proton Aurora Dynamics in Response to the IMF and Solar Wind Variations—Abstract Only. For publication in Geophysical Research Letters, 2002.

CHARLES, P.A. Southampton University
CLARKSON, W.I. Southampton University
COE, M.J. Southampton University
LAYCOCK, S.G.T. Southampton University
TOUT, M. Southampton University
WILSON, C.A. SD50

Long-Term Properties of Accretion Discs in X-Ray Binaries: I. The Variable Third Period in SMC X–1—Abstract Only. For publication in the Monthly Notices of the Royal Astronomical Society, 2002.

CHAVERS, G. TD40
CHANG-DIAZ, F. Johnson Space Center

Investigation of Recombination Processes in a Magnetized Plasma-Experiment Status—Abstract Only. For presentation at the AIAA 33rd Plasmadynamics and Lasers Conference, Maui, HI, May 20–23, 2002.

CHAVERS, G. TD40
CHANG-DIAZ, F. Johnson Space Center

Momentum Flux Measuring Instrument for Neutral and Charged Particle Flows. For publication in Review of Scientific Instruments, 2002.

CHRISTIAN, H.J. SD60
BLAKESLEE, R.J. SD60
BOCCIPPIO, D.J. SD60
BOECK, W.L. Niagara University
BUECHLER, D.E. UAH
DRISCOLL, K.T. UAH
GOODMAN, S.J. SD60
HALL, J.M. CSC
KOSHAK, W.J. SD60
ET AL.

Global Frequency and Distribution of Lightning as Observed From Space by the Optical Transient Detector—Abstract Only. For publication in the Journal of Geophysical Research, 2002.

CHU, T. Southern Illinois University
LEYTE, A. Southern Illinois University
DIGREGORIO, A. Southern Illinois University
RUSSELL, S.S. ED32
WALKER, J.L. ED32

Micro-Cracking Detection in Laminated Composites—Abstract Only. For presentation at The American Society for Nondestructive Testing Conference, Portland, OR, March 20, 2002.

CHUA, D. University of Washington
PARKS, G.K. University of CA, Berkeley
BRITTNACHER, M. University of Washington
GERMANY, G.A. UAH
SPANN, J.F. SD50

Auroral Substorm Time Scales: Seasonal and IMF Variations—Abstract Only. For publication in the Journal of Geophysical Research, 2002.

CIFELLI, R.
PETERSEN, W.A.
BOCCIPPIO, D.J. SD60
FAIRALL, C.W.
RUTLEDGE, S.A.

Ship Radar Observations of a Developing Hurricane in the East Pacific—Abstract Only. For presentation at and publication in the Proceedings of the American Meteorological Society 25th Conference on Hurricanes and Tropical Meteorology, San Diego, CA, April 29–May 3, 2002.

CISSOM, R.D. FD32
HORVATH, T.J. FD32
WATSON, K.S. Teledyne Brown Engineering

The Implementation of Payload Safety in an Operational Environment. For presentation at the Joint ESA/NASA Spaceflight Safety Conference, Noordwijk, the Netherlands, June 11–14, 2002.

CLARK-INGRAM, M.A. ED36
NASA Principal Center for Review of Clean Air Act Regulations—Abstract Only. For presentation at 5th Aerospace Materials, Processes, and Environmental Technology Conference, Huntsville, AL, September 16–18, 2002.

CLAYTON, J.L. ED25
EHLE, C. Thiokol
Thermostructural Analysis of Carbon Cloth Phenolic Material Tested at the Laser Hardened Material Evaluation Laboratory—Abstract Only. For presentation at the JANNAF Interagency Propulsion Committee Meeting, San Antonio, TX, August 27–29, 2002.

COBB, S.D. SD46
HIGGINS, D. SD45
KITCHENS, L. SD45
First Materials Science Research Facility Rack Capabilities and Design Features—Abstract Only. For presentation at The World Space Congress, Houston, TX, October 10–19, 2002.

COBB, S.D. SD46
VOLZ, M.P. SD46
SCHWEIZER, M. USRA
KAISER, N. University of Freiberg
CARPENTER, P.K. USRA
SZOFRAN, F.R. SD46
Characterization of Surface Features in Detached Grown GeSi Crystals—Abstract Only. For presentation at the Fourteenth American Conference on Crystal Growth and Epitaxy, Seattle, WA, August 4–8, 2002.

COFFEY, V.N. SD50
The Propagation and Formation of Electron Holes—Abstract Only. For presentation at the Geospace Environment Modeling Workshop, Telluride, CO, June 23–28, 2002.

COFFEY, V.N. SD50
Low Energy Calibration for Multi-Spacecraft Missions—Abstract Only. For presentation at the International Space Science Institute Workshop on "Calibration Techniques for In Situ Plasma Instrumentation," Bern, Switzerland, September 30–October 4, 2002.

COFFEY, V.N. SD50
Ray-Tracing for Multi-Spacecraft Missions—Abstract Only. For presentation at the International Space Science Institute Workshop on "Calibration Techniques for In Situ Plasma Instrumentation," Bern, Switzerland, September 30–October 4, 2002.

COOKE, W.J. CSC
SUGGS, R.M. ED44
SWIFT, W.R. Raytheon Corp.
GURAL, P.S. SAIC
BROWN, P. University of Western Ontario
Video Observations Encompassing the 2002 Leonid Storm: First Results and a Revised Photometric Procedure for Video Meteor Analysis—Abstract Only. For presentation at the International Conference of Asteroids, Comets, Meteors—ACM2002, Berlin, Germany, July 29–August 2, 2002.

COOPER, K.G. ED34
Advancements in Binder Systems for Solid Freeform Fabrication—Abstract Only. For presentation at the 5th Aerospace Materials, Processes, and Environmental Technology Conference, Huntsville, AL, September 16–18, 2002.

COOPER, K.G. ED34
Microgravity Manufacturing—Abstract Only. For presentation at the 5th Aerospace Materials, Processes, and Environmental Technology Conference, Huntsville, AL, September 16–18, 2002.

CRAFT, M. Dynamic Concepts, Inc.
HOWSMAN, T. Dynamic Concepts, Inc.
O'NEIL, D.A. FD02
Evolutionary Design and Simulation of a Tube Crawling Inspection Robot. For presentation at The Huntsville Simulation Conference, Huntsville, AL, October 9–10, 2002.

CRAIG, L. SD70
Predicting Print-Thru for the Sub-Scale Beryllium Mirror Demonstrator (SBMD) —Abstract Only. For presentation at the Second Annual Technology Days, Huntsville, AL, May 22–24, 2002.

CROELL, A. UAH
KAISER, N. UAH
SZOFRAN, F.R. SD47
COBB, S.D. SD47
VOLZ, M.P. SD47
Wetting Angles and Surface Tension of Ge1-xSix Melts on Different Substrate Materials—Abstract Only. For publication in the Journal of Crystal Growth, 2002.

CUMMINGS, R. SD70
Overview of MSFC AMSD Integrated Modeling and Analysis—Abstract Only. For presentation at the Second Annual Technology Days, Huntsville, AL, May 22–24, 2002.

CUMMINGS, R.O. ED42
LEVINE, M.B. Jet Propulsion Laboratory
VAN BUREN, D. Goddard Space Flight Center
KEGLEY, J.R. SD74
GREEN, J.J. Jet Propulsion Laboratory
HADAWAY, J.B. UAH
PRESSON, J.B. SD71
CLINE, T. Sverdrup
Analytical Verifications in Cryogenic Testing of NGST Advanced Mirror System Demonstrators—Abstract Only. For presentation at the SPIE Astronomical Telescopes and Instrumentation Conference, Waikola, HI, August 22–28, 2002.

CURTIS, L.A. TD11
JOHNSON, L. TD15
Propulsive Small Expendable Deployer System (ProSEDS). For presentation at the Space Technology & Applications International Forum, Albuquerque, NM, February 3–6, 2002.

CURTIS, L.A. TD11
VAUGHN, J.A. ED31
WELZYN, K.J. TD55
CARROLL, J. Tether Applications
Development of the Flight Tether for ProSEDS. For presentation at the Space Technology and Applications International Forum, Albuquerque, NM, February 3–6, 2002.

CUTTEN, D.R. SD60
ROTHERMEL, J. SD60
JARZEMBSKI, M.A. SD60
HARDESTY, R.M. SD60
HOWELL, J.N. SD60
TRATT, D.M. SD60
SRIVASTAVA, V. SD60
Radiometric Calibration of an Airborne $CO_2$ Pulsed Doppler Lidar Using a Natural Earth Surface—Abstract Only. For publication in the Applied Optics Journal, 2001.

D'AGOSTINO, M.G. TD63
LEE, Y.C. TD63
WANG, T.-S. TD63
X–33 XRS–2200 Linear Aerospike Engine Sea Level Plume Radiation. For presentation at the 26th JANNAF Exhaust Plume Technology Subcommittee Meeting, San Antonio, TX, November 5–9, 2001.

DARDEN, C. National Weather Office
CARROLL, B. SD60
LAPENTA, W.M. SD60
JEDLOVEC, G.J. SD60
GOODMAN, S.J. National Weather Office
BRADSHAW, T. National Weather Office
GORDON, J. National Weather Office
Bridging the Gap Between Research and Operations in the National Weather Service: The Huntsville Model—Abstract Only. For presentation at the 2002 NWA Annual Meeting, Fort Worth, TX, October 21–25, 2002.

DAVIS, N.J. FD01
*International Space Station*: Past, Present, and Future. For presentation at the University of Yucatan, Yucatan, Mexico, June 24–27, 2002.

DAVISON, D. Shock Transients, Inc.
COUR-PALAIS, B. Consultant
QUAN, X. Century Dynamics, Inc.
HOLMQUIST, T.J. Network Computing Services
COHEN, L. Smithsonian Astro Observatory
RAMSEY, R. Auburn University
CUMMINGS, R. SD70
Computer Models of Micrometeoroid Impact on Fused Silica Glass Mirrors—Abstract Only. Presented at the Second Annual Technology Days, Huntsville, AL, May 22–24, 2002.

DAWSON, K.S. University of CA, Berkeley
HOLZAPFEL, W.L. University of CA, Berkeley
CARLSTROM, J.E. University of Chicago
JOY, M.K. SD50
LAROQUE, S.J. University of Chicago
MILLER, A. University of Chicago
NAGAI, D. University of Chicago
Measurement of Arcminute-Scale Cosmic Microwave Background Anisotropy With the BIMA Array—Abstract Only. For publication in The Astrophysical Journal, 2002.

DELAY, T.K. ED34
Composite Tanks and Pressure Vessel Development. For presentation at the Science of Advanced Materials and Process Engineering Series, Long Beach, CA, May 12–16, 2002.

DELAY, T.K. ED34
ROBERTS, J.K. Thiokol
Development of Segmented Composite Toroidal Tanks—Abstract Only. For presentation at the 5th Aerospace Materials, Processes, and Environmental Technology Conference, Huntsville, AL, September 16–18, 2002.

DENG, Z.T. Alabama A&M University
ROJAS-OVIEDO, R. Alabama A&M University
CHOW, A. TD15
LITCHFORD, R.J. TD15
Prediction of Shock Wave Structure in Weakly Ionized Gas Flow by Solving MGD Equation—Abstract Only. For

presentation at the AIAA 33rd Plasmadynamics and Lasers Conference, Maui, HI, May 20–23, 2002.

DEXTER, C.D. TD61
MSFC Combustion Devices in 2001. For presentation at the Penn State University Propulsion Research Center 13th Annual Symposium on Propulsion, Huntsville, AL, October 22–23, 2001.

DIETZ, K.L. SD50
RAMSEY, B.D. SD50
ALEXANDER, C.D. SD50
APPLE, J.A. SD50
GHOSH, K.K. USRA
SWIFT, W.R. Raytheon ITSS
A Daytime Aspect Camera for Balloon Altitudes. For publication in Optical Engineering, October 2002.

DIGESU, S.V. FD32
SCHEUERMANN, K. TBE
GLOVER, V. TBE
LANKFORD, K. LMC
An Overview of the Process for Pre-Launch Checkout and Transition Activities in Support of the *International Space Station* (*ISS*) Payload Operations Integration Center—Abstract Only. For presentation at the Institute of Electrical and Electronics Engineering Aerospace Conference, Big Sky, MT, March 8–15, 2003.

DING, R.J. ED33
Thermal Stir Welding—A New Solid State Welding Process—Abstract Only. For presentation at The 2nd Annual NASA Advanced Materials Symposium, Cleveland, OH, May 29–31, 2002.

DORNEY, D.J. TD64
GRIFFIN, L.W. TD64
HUBER, F.W. Riverbend Design Services
SONDAK, D.L. Boston University
Effects of Endwall Geometry and Stacking on Two-Stage Supersonic Turbine Performance. For presentation at the 40th AIAA Aerospace Sciences Meeting & Exhibit, Reno, NV, January 14–17, 2002.

DORNEY, D.J. TD64
GRIFFIN, L.W. TD64
HUBER, F.W. Riverbend Design Services
SONDAK, D.L. Boston University
Unsteady Flow in a Supersonic Turbine With Variable Specific Heats. For publication in the AIAA Journal of Propulsion and Power, March–April, 2002.

DORNEY, D.J. TD64
GRIFFIN, L.W. TD64
HUBER, F.W. Riverbend Design Services
SONDAK, D.L. Boston University
Effects of Endwall Geometry and Stacking on Two-Stage Supersonic Turbine Performance. For publication in the AIAA Journal of Propulsion & Power, November–December 2002.

DORNEY, D.J. TD64
GRIFFIN, L.W. TD64
SONDAK, D.L. Boston University
Full and Partial Admission Performance of the Simplex Turbine. For presentation at the 38th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, Indianapolis, IN, July 7–10, 2002.

DORNEY, D.J. TD64
SONDAK, D.L. Boston University
The CORSAIR Turbomachinery Code: Status and Plans. For presentation at the JANNAF 26th Airbreathing Propulsion Subcommittee Meeting, Destin, FL, April 8–12, 2002.

DUKEMAN, G.A. TD54
Atmospheric Ascent Guidance for Rocket-Powered Launch Vehicles. For presentation at the AIAA Guidance, Navigation, and Control Conference & Exhibit, Monterey, CA, August 5–8, 2002.

DUKEMAN, G.A TD54
Profile-Following Entry Guidance Using Linear Quadratic Regulator Theory. For presentation at the AIAA Guidance, Navigation, and Control Conference & Exhibit, Monterey, CA, August 5–8, 2002.

DUMBACHER, D.L. UP01
NASA's Second-Generation Reusable Launch Vehicle Program Introduction, Status, and Future Plans. For presentation at the 38th AIAA/ASME/SAE/ASEE Joint Propulsion Conference & Exhibit, Indianapolis, IN, July 7–10, 2002.

DUMBACHER, D.L. UP01
Space Launch Initiative New Capabilities…New Horizons. For presentation at the 10th Japan-U.S. Conference on Composite Materials, Stanford University, Stanford, CA, September 16–18, 2002.

DYUDINA, U.A. Caltech
INGERSOLL, A.P. Caltech
BOCCIPPIO, D.J. SD60

Comparison of Jovian and Terrestrial Lightning as Observed From Space. For presentation at the Division for Planetary Sciences, New Orleans, LA, November 27–December 1, 2001.

EBERLE, B. TD15
FARRIS, B. TD15
JOHNSON, L. TD15
JONES, J. TD15
KOS, L.D. TD15
WOODCOCK, G.R. TD15

Selection and Prioritization of Advanced Propulsion Technologies for Future Space Missions. For presentation at the 38th AIAA/ASME/SAE/ASEE Joint Propulsion Conference & Exhibit, Indianapolis, IN, July 7–10, 2002.

EDWARDS, D.L. ED31
HUBBS, W. ED31
STANALAND, T. ED31

Characterization of Space Environmental Effects on Candidate Solar Sail Material—Abstract Only. For presentation at the International Symposium on Optical Science and Technology, SPIE's 47th Annual Meeting, Seattle, WA, July 7–11, 2002.

ELSNER, R.F. SD50
GLADSTONE, G.R. SwRI
WAITE, J.H., JR. University of Michigan
CRARY, F.J. University of Michigan
HOWELL, R.R. University of Wyoming
JOHNSON, R.E. University of Virginia
FORD, P.G. MIT
TENNANT, A.F. SD50
WEISSKOPF, M.C. SD50
ET AL.

Discovery of Soft X-Ray Emission From Io, Europa, and the Io Plasma Torus—Abstract Only. For publication in Nature, 2002.

ELSNER, R.F. SD50
GLADSTONE, G.R. SwRI
WAITE, J.H., JR. University of Michigan
CRARY, F.J. University of Michigan
HOWELL, R.R. University of Wyoming
JOHNSON, R.E. University of Virginia
FORD, P.G. MIT
TENNANT, A.F. SD50
WEISSKOPF, M.C. SD50
ET AL.

Discovery of Soft X-Ray Emission From Io, Europa, and the Io Plasma Torus—Abstract Only. For publication in The Astrophysical Journal, 2002.

ELSNER, R.F. SD50
TENNANT, A.F. SD50
WEISSKOPF, M.C. SD50
GLADSTONE, G.R. SwRI
LEWIS, W.S. SwRI
WAITE, J.H., JR. University of Michigan
CRARY, F.J. University of Michigan
GRODENT, D.C. University of Michigan
ET AL.

Observations of the Jovian System With the Chandra X-Ray Observatory—Abstract Only. For presentation at and publication in the April Meeting Bulletin of The American Physical Society, Albuquerque, NM, April 20–23, 2002.

ELSNER, R.F. SD50
WAITE, J.H., JR. University of Michigan
CRARY, F.J. University of Michigan
MAJEED, T. University of Michigan
GLADSTONE, G.R. SwRI
LEWIS, W.S. SwRI
FORD, P.G. MIT
TENNANT, A.F. SD50
ET AL.

Chandra X-Ray Observations of the Jovian System—Abstract Only. For presentation at the 34th Annual Meeting of the Division for Planetary Science, American Astronomical Society, Birmingham, AL, October 6–11, 2002.

EMERSON, C.W. Western Michigan University
QUATTROCHI, D.A. SD60
LAM, N.S.-N. Louisiana State University

Spatial Metadata for Global Change Investigations Using Remove Sensing—Abstract Only. For presentation at the Second International Conference on Geographic Information Science, Boulder, CO, September 25–28, 2002.

EMRICH, W.J., JR. TD40

Current Status of the Gasdynamic Mirror Fusion Propulsion Experiment. For presentation at the Space Technology Applications International Forum, Albuquerque, NM, February 3–6, 2002.

EMRICH, W.J., JR. TD40

System Description of the Gasdynamic Mirror Propulsion System. For publication in Transactions of the American Nuclear Society Annual Meeting, International Congress on Advanced Nuclear Power Plants, Hollywood, FL, June 9–13, 2002.

EMRICH, W.J., JR. TD40
First Results of the Gasdynamic Mirror Experiment—Abstract Only. For presentation at the Space Technology and Applications International Forum, Albuquerque, NM, February 2–5, 2003.

ENG, R. SD73
FREISCHLAD, K. ADE Phase Shift
HADAWAY, J.B. UAH
Interferometer for Testing in Vibration Environments—Abstract Only. For presentation at the International Symposium on Optical Science and Technology, SPIE's 47th Annual Meeting, Seattle, WA, July 7–11, 2002.

ENG, R. SD70
HRABA, J.F. SD70
THORNTON, G. SD70
BAKER, M. SD70
HAIGHT, H. SD70
HADAWAY, J.B. UAH
BLACKWELL, L. UAH
AMSD Reaction Structure Cryo Deformation Test Plan—Abstract Only. For presentation at the Second Annual Technology Days, Huntsville, AL, May 22–24, 2002.

ENGEL, H.P. Wyle Labs
GILLIES, D.C. SD41
Uses of Computed Tomography in the NASA Materials Science Program—Abstract Only. For presentation at The World Space Congress, Houston, TX, October 10–19, 2002.

EVANS, S.W. ED44
Tethers as Debris: Hydrocode Simulation of Impacts of Tether Fragments on Planar Aerospace Materials. For presentation at The World Space Congress, Houston, TX, October 10–19, 2002.

EVANS, S.W. ED44
LEWIS, H. ED44
WILLIAMSEN, J. University of Denver
EVANS, H. University of Denver
BOHL, W. University of Denver
Bounding the Risk of Crew Loss Following Orbital Debris Penetration of the *International Space Station* at Assembly Stages 1J and 1E. For presentation at the 34th COSPAR Scientific Assembly/The World Space Congress, Houston, TX, October 10–19, 2002.

FALCONER, D.A. UAH/SD50
MOORE, R.L. SD50
GARY, G.A. SD50
Use of Yohkoh SXT in Measuring the Net Current and CME Productivity of Active Regions—Abstract Only. For presentation at the Multiwavelength Observations of Coronal Structure and Dynamics—Yohkoh 10th Anniversary Meeting, Kona, HI, January 21–24, 2002.

FALCONER, D.A. SD50
MOORE, R.L. SD50
GARY, G.A. SD50
Forecasting Coronal Mass Ejections From Vector Magnetograms—Abstract Only. For presentation at the 200th Meeting of the American Astronomical Society, Albuquerque, NM, June 2–6, 2002.

FALCONER, D.A. UAH/SD50
MOORE, R.L. SD50
GARY, G.A. SD50
Correlation of the CME Productivity of Solar Active Regions With Measures of Their Global Nonpotentiality From Vector Magnetograms: Baseline Results—Abstract Only. For publication in The Astrophysical Journal, 2002.

FINCKENOR, M.M. ED31
VISENTINE, J. Boeing
ADAM, S. Boeing
ZWIENER, J. AZ Technology
LOEBS, V. Boeing
Contamination, UV Radiation, and Atomic Oxygen Effects on *ISS* Thermal Control Materials—Abstract Only. For presentation at the 41st AIAA Aerospace Sciences Meeting & Exhibit, Reno, NV, January 6–9, 2003.

FISHMAN, G.J. SD50
An Introduction to High-Energy Astrophysics: Detectors, Techniques, and Missions—Abstract Only. For presentation at The 2nd High-Energy Astrophysics Workshop for Amateur Astronomers, Waikoloa Beach, HI, July 4–5, 2002.

FISHMAN, G.J. SD50
EXIST: The Next Large GRB Observatory—Abstract Only. For presentation at the Rome Gamma-Ray Burst Conference, Rome, Italy, September 17–22, 2002.

FLEMINGS, M.C. SD46
MATSON, D.M. SD46
LOSER, W. SD46
HYERS, R.W. SD46
ROGERS, J.R. SD46
Flight Planning for the *International Space Station*—Levitation Observation of Dendrite Evolution in Steel Ternary Alloy Rapid Solidification—Abstract Only. For presentation at and publication in the Proceedings of the

Microgravity Materials Science Conference, Huntsville, AL, June 25–26, 2002.

FRADY, G. ED21
JENNINGS, J.M. ED21
MIMS, K. ED21
BRUNTY, J. ED21
CHRISTENSEN, E.R. SAIC

Engine System Loads Analysis Compared to Hot-Fire Data. For presentation at the 43rd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Denver, CO, April 22–25, 2002.

FREY, H.U. University of CA, Berkeley
IMMEL, T.J. University of CA, Berkeley
MENDE, S.B. University of CA, Berkeley
GERARD, J.-C. University of Liege
HUBERT, B. University of Liege
HABRAKEN, S. Centre Spatial de Liege
SPANN, J.F. SD50
GLADSTONE, G.R. SwRI
BISIKALO, D.V. Russian Academy of Science
SHEMATOVICH, V.I. Russian Academy of Science

Summary of Quantitative Interpretation of Image Far Ultraviolet Auroral Data—Abstract Only. For presentation at the 34th COSPAR Scientific Assembly/The World Space Congress, Houston, TX, October 10–19, 2002.

FULLER, K.A. UAH
SMITH, D.D. SD46

Partial Wave Analysis of Coupled Photonic Structures—Abstract Only. For presentation at the OSA Conference on Optics in the Southeast, Huntsville, AL, October 24–25, 2002.

GALLAGHER, D.L. SD50
ADRIAN, M.L. SD50
FUNG, S.F. Goddard Space Flight Center
GREEN, J.L. Goddard Space Flight Center
SANDEL, B.R. University of Arizona

Plasmasphere Empirical Modeling With the IMAGE Mission—Abstract Only. For presentation at the XXVIIth General Assembly of the International Union of Radio Science, Maastricht, the Netherlands, August 17–24, 2002.

GALLAGHER, D.L. SD50
ADRIAN, M.L. SD50
GOLDSTEIN, J. SD50
SANDEL, B.R. SD50

Evidence for Subauroral Electric Fields From IMAGE EUV—Abstract Only. For presentation at the American Geophysical Union Fall Meeting, San Francisco, CA, December 6–10, 2002.

GALLAGHER, D.L. SD50
ADRIAN, M.L. SD50
SANDEL, B.R. SD50

IMAGE–EUV Observation of Large-Scale Standing Wave Pattern in the Nightside Plasmasphere—Abstract Only. For presentation at the American Geophysical Union Fall Meeting, San Francisco, CA, December 6–10, 2002.

GALLAGHER, D.L. SD50
ADRIAN, M.L. SD50
SANDEL, B.R. SD50
GREEN, J.L. SD50
REINISCH, B. SD50
GOLDSTEIN, J. SD50
HUEGRICH, T. SD50

Empty Flux Tubes and Plasmasphere Refilling as Seen by IMAGE—Abstract Only. For presentation at the American Geophysical Union Spring Meeting, Washington, DC, May 28–31, 2002.

GALLAGHER, D.L. SD50
OBER, D. SD50
ADRIAN, M.L. SD50

IMAGE–EUV and RPI Derived Distributions of Plasmaspheric Plasma and Plasmaspheric Modeling—Abstract Only. For presentation at the Magnetospheric Imaging Workshop, Yosemite National Park, CA, February 5–8, 2002.

GARCIA, D. ED41
GILL, P.S. ED41
VAUGHAN, W.W. UAH

NASA Materials Related Lessons Learned—Abstract Only. For presentation at the 5th Aerospace Materials, Processes, and Environmental Technology Conference, Huntsville, AL, September 16–18, 2002.

GARY, G.A. SD50
BALASUBRAMANIAM, K.S.
SIGWARTH, M.

Multiple Etalon Systems for the Advanced Technology Solar Telescope—Abstract Only. For presentation at the Conference on Innovative Telescopes for Solar Astrophysics, Paris, France, March 18–20, 2002, and publication in the Proceedings of the Society of Photo-Optical Instrumentation Engineers, 2002.

GARY, G.A. SD50
DAVIS, J.M. SD50
MOORE, R.L. SD50

On Determination of Three-Dimensional Morphology and Plasma Properties of the Solar Corona—Abstract Only. For presentation at the First STEREO Workshop, Paris, France, March 18–20, 2002.

GASKIN, J.A. UAH
SHARMA, D.P. SD50
RAMSEY, B.D. SD50
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VAUGHAN, W.W. UAH
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VAUGHAN, W.W. UAH
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Ground-Based Research Within NASA's Materials Science Program—Abstract Only. For presentation at The World Space Congress, Houston, TX, October 10–19, 2002.

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SU, C.-H. SD46
SZOFRAN, F.R. SD46
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COBB, S.D. SD46
LEHOCZKY, S.L. SD46
Effect of Residual Accelerations on the Crystal Growth of II–VI Semiconductors in Low-Earth Orbit—Abstract Only. For presentation at the Fourteenth American Conference on Crystal Growth and Epitaxy, Seattle, WA, August 4–8, 2002.

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WAITE, J.H., JR. University of Michigan
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CRARY, F.J. University of Michigan
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FRAZIER, D.O. SD46
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WITHEROW, W.K. SD46
WANG, K. Rensselaer Polytech Institute
FACEMIRE, B. USRA
ALLEN, T. ICRC
INGUVA, R. East West Enterprises

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Fundamental Boiling and RP–1 Freezing Experiments. For presentation at the Thermal and Fluids Analysis Workshop, Huntsville, AL, September 10–14, 2001.

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BOCCIPPIO, D.J. SD60
KOSHAK, W.J. SD60
BAILEY, J.
HALL, J.M.
BATEMAN, M.
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VILLEGAS, Y. Our Lady of the Lake University
NWOSISI, G. Florida A&M University

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GRANT, J. SD72
JACKSON, K.V. ED12
WANG, Y. Alabama A&M University
SHARMA, A. Alabama A&M University
Fabrication and Characterization of Tilted Fiber Optic Bragg Grating Filters Over Various Wavelengths—Abstract Only. For presentation at and publication in the Proceedings of the 2002 OSA Annual Meeting and Exhibit/LS–XVIII, Orlando, FL, September 29–October 3, 2002.

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KAUL, R.K. SD72
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JACKSON, K.V. SD72
MYERS, G. SD72
WANG, Y. Alabama A&M University
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CARRUTH, M.R., JR. ED31
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BOXX, D.L. TD53
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KYNARD, M.H. TD53
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DORNEY, D.J. TD64
SNELLGROVE, L.M. TD63
ZOLADZ, T.F. TD63
STROUD, R.T. TD62
MSFC Turbine Performance Optimization (TPO) Technology Verification Status—Presentation Only. For presentation at the JANNAF 26th Airbreathing Propulsion Subcommittee Meeting, Destin FL, April 8–12, 2002.

GRUBBS, R. AD32
LINDBLIM, W. CSC
NASA Imaging for Safety, Science, and History. For presentation at the Society of Motion Picture and Television Engineers, 36th Advanced Motion Imaging Conference, Dallas, TX, February 7–9, 2002.

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ANILKUMAR, A. SD46
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BRUSH, L.N. University of Washington
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FERGUSON, I. JPL
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GWALTNEY, D.A. ED17
KING, K.D. ED17
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Implementation of Adaptive Digital Controllers on Programmable Logic Devices—Abstract Only. For presentation at the Fifth Annual Military and Aerospace Programmable Logic Devices International Conference, Laurel, MD, Septem-ber 10–12, 2002.

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BLACKWELL, L. UAH
MATHEWS, G. Kodak
ENG, R. SD70
STAHL, H.P. SD70
HRABA, J.F. SD70
THORNTON, G. SD70
MSFC Test Results for Selected Mirrors: Brush-Wellman/Goodrich 0.5-Meter Joined-Beryllium Mirror, IABG 0.5-Meter C/SiC Mirror, Xinetics 0.5-Meter SiC Mirror, Kodak 0.23-Meter SiO2 Mirror—Abstract Only. For presentation at the Second Annual Technology Days, Huntsville, AL, May 22–24, 2002.

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BROWN, B. Ball Aerospace
ENG, R. SD70
STAHL, P. SD70
MSFC/Ball Space-Act Test Results of SBMD—Abstract Only. For presentation at the Second Annual Technology Days, Huntsville, AL, May 22–24, 2002.

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REARDON, P. UAH
GEARY, J. UAH
ROBINSON, B. UAH
STAHL, H.P. SD70
KEGLEY, J.R. SD70
CUMMINGS, R. SD70
AMSD Test Plan—Abstract Only. For presentation at the Second Annual Technology Days, Huntsville, AL, May 22–24, 2002.

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Second-Generation Reusable Launch Vehicle Concepts for Flight Operations. For presentation at the Space Ops 2002 Conference/The World Space Congress, Houston, TX, October 10–19, 2002.

HALL, D.P. ED19
LY, W. ED19
HOWARD, R.T. ED19
WEIR, J.M. ED19
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Software Development for the Hobby-Eberly Telescope's Segment Alignment Maintenance System Using LabVIEW™—Abstract Only. For presentation at the SPIE Astronomical Telescopes and Instrumentation Conference, Waikoloa, HI, August 22–28, 2002.

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Improving Space Project Cost Estimating With Engineering Management Variables. For presentation at

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HAMAKER, J.W. VS20
Estimating the Cost of NASA's Space Launch Initiative: How SLI Costs Stack Up Against the Shuttle—Abstract Only. For presentation at the SSCAG Meeting, Frascati, Italy, June 11–13, 2002.

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Cost Estimation and Control for Flight Systems—Abstract Only. For presentation at the Propulsion for Space Transportation of the XXIst Century Symposium, Versailles, France, May 14–17, 2002.

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A Plan for Advanced Guidance and Control Technology for Second-Generation Reusable Launch Vehicles. For presentation at the AIAA Guidance, Navigation, and Control Conference & Exhibit, Monterey, CA, August 5–8, 2002, and publication in the AIAA Journal of Guidance, Control, and Dynamics, 2002.

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JONES, R.E. Sverdrup
KRUPP, D.R. TD54
Advanced Guidance and Control Methods for Reusable Launch Vehicles: Test Results. For presentation at the AIAA Guidance, Navigation, and Control Conference & Exhibit, Monterey, CA, August 5–8, 2002.

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MINOR, J.L. ED03
Overview of NASA's Space Environments & Effects (SEE) Program—Abstract Only. For presentation at the AIAA Meeting, Reno, NV, January 14–17, 2002.

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WILSON, C.A. SD50
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PACIESAS, W.S. SD50
ZHANG, S.N. SD50
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STERLING, A.C. SD50
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REICHMANN, E.J. SD50
Group Sunspot Numbers: Sunspot Cycle Characteristics—Abstract Only. For publication in Solar Physics Journal, 2002.

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HAGOPIAN, J. FD34
The Console in a Briefcase: An Approach to Remote Space Operations—Abstract Only. For presentation at the Space Ops 2002 Conference/The World Space Congress, Houston, TX, October 10–19, 2002.

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Mission Engineering of a Rapid Cycle Spacecraft Logistics Fleet—Abstract Only. For presentation at the Space Ops 2002 Conference/The World Space Congress, Houston, TX, October 10–19, 2002.

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ELAM, S. SD42
MCKECHNIE, T. Plasma Processes, Inc.
HICKMAN, R. Plasma Processes, Inc.
Robust Low-Cost Liquid Rocket Combustion Chamber by Advanced Vacuum Plasma Process—Abstract Only.

For presentation at the 39th Space Congress, Cape Canaveral, FL, April 29–May 2, 2002.

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GUILLORY, A. SD60
LAFONTAINE, F.J. Raytheon ITSS
CECIL, D.J. UAH
HEYMSFIELD, G. UAH

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KAKAR, R. SD60
ZIPSER, E. SD60
KRISHNAMURTI, T.N. SD60
MARKS, F. SD60

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PIKUTA, E.V. UAH
MARSIC, D. UAH
NG, J.D. UAH

Anaerobic Psychrophiles From Alaska, Antarctica, and Patagonia: Implications to Possible Life on Mars and Europa—Abstract Only. For presentation at and publication in the Proceedings of the SPIE Conference on Instruments, Methods, and Missions for Astrobiology IV, San Diego, CA, July 29–August 3, 2001.

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WHITMAN, W.B. University of Georgia
TANG, J. American Type Culture
KRADER, P. American Type Culture

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KOS, L.D. TD40
POSTON, D.I. TD40

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KOS, L.D. TD40
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VAN DYKE, M.K. TD40
GODFROY, T.J. TD40
PEDERSEN, K.W. TD40
MARTIN, J.J. TD40
DICKENS, R.E. Sverdrup
SALVAIL, P. IITRI
HRBUD, I. Sverdrup
CARTER, R.W. TD40

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PEDERSEN, K.W. TD40
MARTIN, J.J. TD40
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SALVAIL, P. IITRI
HRBUD, I. Sverdrup
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MANKINS, J.C. Headquarters
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CRAFT, M. Dynamic Concepts, Inc.
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A Biologically Inspired Cooperative Multirobot Control Architecture. For presentation at The Huntsville Simulation Conference, Huntsville, AL, October 9–10, 2002.

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VAN DYKE, M.K. TD40
HOUTS, M.G. TD40
GOODFELLOW, K. JPL
End-to-End Demonstrator of the Safe, Affordable Fission Engine (SAFE) 30: Power Conversion and Ion Engine Operation. For presentation at the Space Technology and Applications International Forum, Albuquerque, NM, February 3–6, 2002.

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ZOLADZ, T.F. TD63
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HUTT, J.J. TD15
MCCLINTON, C. Langley Research Center
NASA's Hypersonic Program—A Status Report—Abstract Only. For presentation at the Propulsion for Space Transportation of the XXIst Century Symposium, Versailles, France, May 14–17, 2002.

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MCCLINTON, C. Langley Research Center
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HUI, D. Yonsei University
KIM, J.-S. Yonsei University
KIM.Y.-T. Yonsei University
AN, I. Hanyang University
PALEY, M.S. SD48
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GRIMSLEY, B.W. Langley Research Center
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DISCHINGER, C. ED42
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NORMAN, M.L. SensIR Technologies
FULLER, K.A. UAH
SRIVASTAVA, V. USRA
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TUCKER, D.S. SD70
Rare-Earth Oxide ($Yb_2O_3$) Selective Emitter Fabrication and Evaluation. For presentation at the PAC RIM 4 International Conference on Advanced Glasses and Ceramics, Maui, HI, November 4–8, 2001.

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GILCHRIST, M.L. FD35
Space Operations Training Concepts Benchmark Study (Training in a Continuous Operations Environment) — Abstract Only. For presentation at the *ISS* Utilization Conference—The Microgravity Environment/The World Space Congress, Houston, TX, October 10–19, 2002.

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Friction-Stir Welding of Aluminum for the Space Program—Abstract Only. For presentation at the Alabama Chapter of ASM International Meeting, Birmingham, AL, April 12, 2002.

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MUNTELE, I. Alabama A&M University
MUNTELE, C. Alabama A&M University
ZIMMERMAN, R.L. Alabama A&M University
ILA, D. Alabama A&M University
Production of Ultra-Light Normal Incidence Mirrors—Abstract Only. For presentation at the SPIE Astronomical Telescopes and Instrumentation Conference, Waikoloa, HI, August 22–28, 2002.

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MUNTELE, C. Alabama A&M University
ZIMMERMAN, R.L. Alabama A&M University
ILA, D. Alabama A&M University
Study of Lightweight Ni-Co Alloy Mirrors Obtained by Electroforming Techniques—Abstract Only. For presentation at the SPIE Astronomical Telescopes and Instrumentation Conference, Waikoloa, HI, August 22–28, 2002.

JUDGE, R.A. UAH/SD46
KEPHART, R. UAH/SD46
LEARDI, R.
MYLES, D.A.A. EMBL
SNELL, E.H. USRA/SD46
VAN DER WOERD, M.J. USRA/SD46
Maximizing Macromolecule Crystal Size for Neutron Diffraction Experiments—Abstract Only. For presentation at the XIX Congress of the International Union of Crystallography, Geneva, Switzerland, August 5–14, 2002.

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SNELL, E.H. SD46
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VAN DER WOERD, M.J. SD46
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JOHNSON, D.L. ED44
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JOHNSON, D.L. ED44
Global Summary MGS TES Data and MARS-GRAM Validation—Abstract Only. For presentation at The World Space Congress, Houston, TX, October 10–19, 2002.

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JOHNSON, D.L. ED44
MARS-GRAM Validation With MARS Global Surveyor Data—Abstract Only. For presentation at The World Space Congress, Houston, TX, October 10–19, 2002.

KANNER, H.S. United Space Alliance
STUCKEY, C.I. United Space Alliance
DAVIS, D.W. ED25
Recession Curve Generation for Space Shuttle Solid Rocket Booster Thermal Protection System Coatings. For presentation at the 8th AIAA/ASME Joint Thermophysics and Heat Transfer Conference, St. Louis, MO, June 24–27, 2002.

KAPPUS, K.O. ED27
DRISKILL, T.C. ED27
PARKS, R.A. ED27
Modal Testing of Seven Shuttle Cargo Elements for Space Station. For presentation at the International Modal Analysis Conference, Los Angeles, CA, February 4–7, 2002.

KARR, L.J. SD46
MALONE, C.C. USRA
BURK, M. Morgan Research
MOORE, B.P. UAH
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Characterization of Truncated Tumor-Associated NADH Oxidase (ttNOX)—Abstract Only. For presentation at the XIX Congress of the International Union of Crystallography, Geneva, Switzerland, August 6–15, 2002.

KARR, L.J. SD46
MARSHALL, G. UAB
HOCKETT, R.D. Eli Lilly & Co.
BUCY, R.P. UAB
Determination of the Absolute Number of Cytokine mRNA Molecules Within Individual Activated Human T Cells—Abstract Only. For publication in the Journal of Immunology, 2002.

KAUFFMAN, W.J. ED03
HARDAGE, D.M. ED03
MINOR, J.L. ED03
Technology Development Activities for the Space Environment and Its Effects on Spacecraft—Abstract Only. For presentation at the AIAA/ICAS International Air & Space Symposium and Exposition—The Next 100 Years, Dayton, OH, July 14–17, 2003.

KAUL, R.K. ED34
STUCKERY, I.
Replacement of Ablators With Phase-Change Material for Thermal Protection of STS Elements—Abstract Only. For presentation at the 5th Aerospace Materials, Processes, and Environmental Technology Conference, Huntsville, AL, September 16–18, 2002.

KEGLEY, J.R. SD70
New Cryogenic Optical Test Capability at Marshall Space Flight Center's Space Optics Manufacturing Technology Center—Abstract Only. For presentation at the Second Annual Technology Days, Huntsville, AL, May 22–24, 2002.

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KELTON, K.F. SD46
GANGOPADHYAY, A.K. SD46
LEE, G.W. SD46
HYERS, R.W. SD46
ROGERS, J.R. SD46
ROBINSON, M.B. SD46
RATHZ, T.J. SD46
KRISHNAN, S. SD46
Studies of Nucleation and Growth, Specific Heat, and Viscosity of Undercooled Melts of Quasicrystals and Polytetrahedral-Phase-Forming Alloys—Abstract Only. For presentation at and publication in the Proceedings of the Microgravity Materials Science Conference, Huntsville, AL, June 25–26, 2002.

KHAZANOV, G.V. SD50
Cross-Scale Coupling of Alfvén Turbulence in the Polar Wind Region—Abstract Only. For presentation at the European Geophysical Society XXVII General Assembly, Nice, France, April 21–26, 2002.

KHAZANOV, G.V. SD50
Self-Consistent Magnetosphere-Ionosphere Coupling and Associated Plasma Energization Processes—Abstract Only. For presentation at the Astrophysical Particle Acceleration in Geospace and Beyond Meeting, Chattanooga, TN, October 6–10, 2002.

KHAZANOV, G.V. SD50
GAMAYUNOV, K.V. University of AK Fairbanks
JORDANOVA, V.K. University of New Hampshire
Ring Current Ion Coupling With Electromagnetic Ion Cyclotron Waves—Abstract Only. For presentation at the American Geophysical Union Spring Meeting, Washington, DC, May 28–31, 2002.

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KRIVORUTSKY, E.N. UAH
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LIEMOHN, M.W. University of Michigan
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BLAKESLEE, R.J. SD60
ALTUS Cumulous Electrification Study (ACES)—Abstract Only. For presentation at the Technical Analysis & Applications Center Conference, Santa Fe, NM, October 28–30, 2002.

KOCZOR, R.J. SD01
ADAMS, M.L. SD01
GALLAGHER, D.L. SD01
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KOELBL, T.G. ED13
PONCHAK, D. GRC
LAMARCHE, T. Rannoch Corp.
Digital Avionics. For publication in AIAA Aerospace America, December 2002.

KOS, L.D. TD15
JOHNSON, L. TD15
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TRAUSCH, A.N. TD15
EBERLE, B. TD15
WOODCOCK, G.R. TD15
Benefits of Nuclear Electric Propulsion for Outer Planet Exploration. For presentation at the 38th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, Indianapolis, IN, July 7–10, 2002.

KOSHAK, W.J. SD60
A Lightning Channel Retrieval Algorithm for the North Alabama Lightning Mapping Array (LMA)—Abstract Only. For presentation at the American Geophysical Union Spring Meeting, Washington, DC, May 28–31, 2002.

KUNDROT, C.E. SD40
BARNES, C.L. SD40
SNELL, E.H. SD40
Thaumatin Crystallization Aboard the *International Space Station* Using Liquid-Liquid Diffusion in the Enhanced Gaseous Nitrogen Dewar (EGN)—Abstract Only. For presentation at the Macromolecular Biotechnology Strategic Planning Committee Meeting, Washington, DC, March 5–6, 2002.

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ROEBER, D.F. USRA
ACHARI, A. Raytheon
Characterization of the Protein Crystal Growth Apparatus for Microgravity Aboard the Space Station—Abstract Only. For presentation at the XIX Congress of the International Union of Crystallography, Geneva, Switzerland, August 6–15, 2002.

LAPENTA, W.M. SD60
BLACKWELL, K. University of South Alabama
SUGGS, R. SD60
MCNIDER, R.T. UAH
JEDLOVEC, G.J. SD60
Land Surface Data Assimilation and the Gulf Coast Sea-Breeze—Abstract Only. For presentation at and publication in the Proceedings of the American Meteorological Society Annual Meeting, Orlando, FL, January 14–17, 2002.

LAPENTA, W.M. SD60
HAINES, S.L. UAH
JEDLOVEC, G.J. SD60
MACKARO, S. UAH
Use of MODIS Land and Sea Surface Temperatures To Initialize Mesoscale Models—Abstract Only. For presentation at the AMS 12th Conference on Interactions of the Sea and Atmosphere, Long Beach, CA, February 9–13, 2003.

LAPENTA, W.M. SD60
MCNIDER, R.T. USRA
BIAZAR, A. UAH
SUGGS, R. SD60
JEDLOVEC, G.J. SD60
DEMBEK, S. USRA
Use of Satellite Data Assimilation To Infer Land Surface Thermal Inertia—Abstract Only. For presentation at the AMS 12th Conference on Interactions of the Sea and Atmosphere, Long Beach, CA, February 9–13, 2003.

LAROQUE, S.J. University of Chicago
CARLSTROM, J.E. University of Chicago
REESE, E.D. University of Chicago
HOLDER, G.P. University of Chicago
HOLZAPFEL, W.L. University of CA, Berkeley
JOY, M.K. SD50
GREGO, L. Harvard-Smithsonian
The Sunyaev-Zel'dovich Effect Spectrum of Abell 2163—Abstract Only. For publication in The Astrophysical Journal, 2002.

LAWS, K. UAH
JEDLOVEC, G.J. SD60
GOES Cloud Detection at the Global Hydrology and Climate Center—Abstract Only. For presentation at the 83rd Annual Meeting of the American Meteorological Society, Long Beach, CA, February 9–13, 2003.

LEE, J.A. ED33
Spin Forming of Aluminum Metal Matrix Composites—Abstract Only. For presentation at the 26th Annual Conference on Composites, Materials & Structures, Cocoa Beach, FL, January 28–31, 2002.

LEE, J.A. ED33
High Stength and Wear Resistant Aluminum Alloy for High-Temperature Applications—Abstract Only. For presentation at the 5th Aerospace Materials, Processes, and Environmental Technology Conference, Huntsville, AL, September 16–18, 2002.

LEIGH, L.M., JR. South Dakota State University
TINKER, M.L. ED21
Dynamic Characterization of an Inflatable Concentrator for Solar Thermal Propulsion. For publication in the Journal of Spacecraft and Rockets, November–December 2002.

LEWIS, R.A. R. Lewis Co.
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Evidence That Clouds of keV Hydrogen Ion Clusters Bounce Elastically From a Solid Surface. For publication in Physical Review Letters, 2002.

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SCRIPA, R.N. UAB
BAN, H. UAB
LIN, B. UAB
SU, C.-H. SD46
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ZHU, S. SD46
Technique for Determining the Viscosity and Electrical Conductivity of Semiconducting Liquids—Abstract Only. For presentation at the 10th International Conference on Modern Materials & Technologies, Florence, Italy, July 14–18, 2002.

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Transient Torque Technique for Viscosity and Electrical Conductivity Determination of Semiconducting Liquids—Abstract Only. For presentation at the 10th International Conference on Modern Materials & Technologies, Florence, Italy, July 14–18, 2002.

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LI, C. UAB
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LEHOCZKY, S.L. SD46
Theory and Simulation of a Novel Viscosity Measurement Method for High-Temperature Semiconductor—Abstract Only. For presentation at the 2002 ASME International Mechanical Engineering Congress & Exposition, New Orleans, LA, November 17–22, 2002.

LITCHFORD, R.J. TD15
Pulse Detonation Rocket MHD Power Experiment—Abstract Only. For presentation at the AIAA 33rd Plasmadynamics and Lasers Conference, Maui, HI, May 20–23, 2002.

LITCHFORD, R.J. TD15
COLE, J. TD15
LINEBERRY, J. LyTec LLC
CHAPMAN, J. LyTec LLC
SCHMIDT, H. LyTec LLC
Magnetohydrodynamic Augmented Propulsion Experiment—Abstract Only. For presentation at the AIAA 33rd Plasmadynamics and Lasers Conference, Maui, HI, May 20–23, 2002.

LUVALL, J.C. SD60
RICKMAN, D.L. SD60
QUATTROCHI, D.A. SD60
ESTES, M.G., JR. USRA
Quantitative Mapping of Reflected and Emitted Energy Patterns Over a City—Abstract Only. For presentation at and publication in the Proceedings of the Workshop on Multi/Hyperspectral Technology and Applications, Redstone Arsenal, AL, February 5–7, 2002.

LUVALL, J.C. SD60
QUATTROCHI, D.A. SD60
RICKMAN, D.L. SD60
ESTES, M.G., JR. USRA
Urban Surface Radiative Energy Budgets Determined Using Aircraft Scanner Data—Abstract Only. For presentation at The North American Urban Heat Island Summit, Toronto, Ontario, Canada, May 1–4, 2002.

MACKARO, S. UAH
LAPENTA, W.M. SD60
BLACKWELL, K. U. of South Alabama
SUGGS, R.J. SD60
MCNIDER, R.T. USRA
JEDLOVEC, G.J. SD60
KIMBALL, S. U. of South Alabama
Application of Land Surface Data Assimilation to Simulations of Sea Breeze Circulations—Abstract Only. For presentation at the AMS 12th Conference on Interactions of the Sea and Atmosphere, Long Beach, CA, February 9–13, 2003.

MACLEOD, T.C. SD22
HO, F.D. UAH
Simulation Model of a Ferroelectric Field Effect Transistor—Abstract Only. For presentation at the International Joint Conference on the Applications of Ferroelectrics, Nara, Japan, May 28, 2002, and publication in the Integrated Ferroelectrics Journal, 2002.

MAJUMDAR, A.K. ED25
Numerical Modeling of Cavitating Venturi—A Flow Control Element of Propulsion System—Abstract Only. For presentation at the Thermal & Fluids Analysis Workshop, Houston, TX, August 12–16, 2002.

MARKUSIC, T.E. TD40
THIO, Y.C.F. TD40
CASSIBRY, J.T. UAH
Design of a High-Energy, Two-Stage Pulsed Plasma Thruster. For presentation at the 38th AIAA/ASME/SAE/ASEE Joint Propulsion Conference & Exhibit, Indianapolis, IN, July 7–10, 2002.

MARSHALL, S. University of North Carolina
OGLESBY, R.J. SD60
Improving the Representation of Snow Hydrology in Global and Regional Climate Models—Abstract Only. For presentation at The 59th Annual Meeting of the Eastern Snow Conference, Stowe, VT, June 5–7, 2002.

MARTIN, A. TD40
ESKRIDGE, R.H. TD40
HOUTS, M.G. TD40
The FRC Acceleration Space Thruster (FAST) Experiment—Abstract Only. For presentation at the 28th International Electric Propulsion Conference, Toulouse, France, March 17–21, 2003.

MARTIN, A.K. TD40
ESKRIDGE, R.H. TD40
HOUTS, M.G. TD40
SLOUGH, J. University of Washington
The FRC Acceleration Space Thruster (FAST) Experiment—Abstract Only. For presentation at the Advanced Space Propulsion Workshop, Pasadena, CA, June 4–6, 2002.

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LEWIS, R.A. R. Lewis Co.
CHAKRABARTI, S.X. TD40
PEARSON, J.B. TD40
Ion Storage Tests With the High-Performance Antiproton Trap (HiPAT). For presentation at the Space Technology and Applications International Forum, Albuquerque, NM, February 3–6, 2002.

MARTIN, J.J. TD40
LEWIS, R.A. R. Lewis Co.
SIMS, W.H. TD40
CHAKRABARTI, S.X. TD40
PEARSON, J.B. TD40
FANT, W.E. TD40
Overview of the High-Performance Antiproton Trap (HiPAT) Experiment—Abstract Only. For presentation at the 17th International Conference on the Application of Accelerators in Research and Industry, Denton, TX, November 12–16, 2002.

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LEWIS, R.A. R. Lewis Co.
SIMS, W.H. TD40
CHAKRABARTI, S.X. TD40
PEARSON, J.B. TD40
FANT, W.E. TD40

Ion Dynamic Capture Experiments With the High-Performance Antiproton Trap (HiPAT)—Abstract Only. For presentation at the Space Technology and Applications International Forum, Albuquerque, NM, February 2–5, 2003.

MASON, B.S. Caltech
PEARSON, T.J. Caltech
READHEAD, A.C.S. Caltech
SHEPHERD, M.C. Caltech
SIEVERS, J. Caltech
UDOMPRASERT, P.S. Caltech
JOY, M.K. SD50
ET AL.

The Anisotropy of the Microwave Background to I=3500: Deep Field Observations With the Cosmic Background Imager—Abstract Only. For publication in The Astrophysical Journal, 2002.

MAXWELL, T.G. FD42

Lessons Learned in Developing Multiple Distributed Planning Systems for the *International Space Station*. For presentation at the Space Ops 2002 Conference/The World Space Congress, Houston, TX, October 9–12, 2002.

MAZURUK, K. SD46
GRUGEL, R.N. SD46

New Experiments With Spinning Metallic Discs—Abstract Only. For presentation at the Space Technology and Applications International Forum, Albuquerque, NM, February 2–5, 2003.

MAZURUK, K. USRA/SD46
RAMACHANDRAN, N. USRA/SD46
GRUGEL, R.N. SD46

Magnetic Field Applications in Semiconductor Crystal Growth and Metallurgy—Abstract Only. For presentation at and publication in the Proceedings of the 40th AIAA Aerospace Sciences Meeting & Exhibit, Reno, NV, January 14–17, 2002.

MCCLURE, J.C. University of Texas, El Paso
CORONADO, E. University of Texas, El Paso
ALOOR, S. University of Texas, El Paso
NOWAK, B. University of Texas, El Paso
MURR, L.M. University of Texas, El Paso
NUNES, A.C., JR. ED33

Effect of Pin Tool Shape on Metal Flow During Friction Stir Welding. For presentation at the 6th International Conference on Trends in Welding Research, Pine Mountain, GA, April 15–19, 2002.

MCCOLLOUGH, M.L. USRA
HARMON, B.A. SD50
FISHMAN, G.J. SD50

Nine Years of Observations of Hard X Rays From Relativistic Jet Objects With BATSE—Abstract Only. For presentation at the Fourth Microquasar Workshop, Corsica, France, May 27–June 1, 2002.

MCFERRIN, M. SD46
SNELL, E.H. SD46

The Development and Application of a Method to Quantify the Quality of Cryoprotectant Conditions Using Standard Area Detector X-Ray Images—Abstract Only. For publication in the Journal of Applied Crystallography, 2002.

MEEGAN, C.A. SD50

Observations of Gamma-Ray Bursts—Abstract Only. For presentation at the Workshop on Laboratory Astrophysics Using High Intensity Particle and Photon Beams, Stanford, CA, October 11–13, 2001.

MEEGAN, C.A. SD50

The GLAST Burst Monitor—Abstract Only. For presentation at the Gamma-Ray Burst and Afterglow Astronomy 2001 Workshop, Woods Hole, MA, November 5–9, 2001.

MEEGAN, C.A. SD50

Science Capabilities of the GLAST Burst Monitor—Abstract Only. For presentation at the High-Energy Astrophysics Division Meeting of the American Astrophysics Society, Albuquerque, NM, April 20–23, 2002.

MEEGAN, C.A. SD50

Gamma-Ray Bursts—Abstract Only. For presentation at the 91st Spring Meeting of the AAVSO and The 2nd High-Energy Astrophysics Workshop for Amateur Astronomers, Waikoloa Beach, HI, June 30–July 6, 2002.

MILLER, R.S. UAH
MALONE, C.C. USRA
MOORE, B.P. UAH
BURK, M. Morgan Research Corp.
CRAWFORD, L. USRA
KARR, L.J. SD46

Choosing Between Yeast and Bacterial Expression Systems: Yield Dependent—Abstract Only. For presentation at the Current Topics in Gene Expression Systems Meeting, San Diego, CA, March 25, 2002.

MIXSON, C.D. FD33
Operational Limitations of the High Rate Frame Multiplexer Onboard the *International Space Station* and How These Limitations Affect Payload Developers and International Partners—Abstract Only. For presentation at the Space Ops 2002 Conference/The World Space Congress, Houston, TX, October 10–19, 2002.

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KNOX, J.C. FD21
SMITH, J.E. UAH
Experimental and Numerical Investigation of Two-Dimensional $CO_2$ Adsorption/Desorption in Packed Sorption Beds Under Nonideal Flows. For publication in the Journal of Separation Science and Technology, 2001.

MOLNAR, S.M. Rutgers University
HUGHES, J.P. Rutgers University
DONAHUE, M. Space Telescope Institute
JOY, M.K. SD50
Chandra Observations of Unresolved X-Ray Sources Around Two Clusters of Galaxies—Abstract Only. For publication in The Astrophysical Journal, 2002.

MONTGOMERY, E.E., IV SD70
The Beamed Energy Technology Working Group, Programs and Goals—Abstract Only. For presentation at the AIAA 33rd Plasmadynamics and Lasers Conference and the 14th International Conference on MHD Power Generation and High Temperature Technologies, Maui, HI, May 20–23, 2002.

MONTGOMERY, E.E., IV SD70
Rapid Maturation of Edge Sensor Technology and Potential Application in Large Space Telescopes With Segmented Primary Mirrors—Abstract Only. For presentation at the SPIE Astronomical Telescopes and Instrumentation Conference, Waikoloa, HI, August 22–28, 2002.

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ZEIDERS, G.W. Sirius Group
Ultralightweight Space Deployable Primary Reflector Demonstrator—Abstract Only. For presentation at the 43rd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference and the 10th AIAA/ASME/AHS Adaptive Structures Conference, Denver, CO, April 22–25, 2002.

MOORE, R.L. SD50
FALCONER, D.A. SD50
PORTER, J.G. SD50
HATHAWAY, D.H. SD50
Coronal Heating and the Increase of Coronal Luminosity With Magnetic Flux—Abstract Only. For presentation at the 200th Meeting of the American Astronomical Society, Albuquerque, NM, June 2–6, 2002, and publication in The Bulletin of the American Astronomical Society, 2002.

MOORE, R.L. SD50
STERLING, A.C. SD50
FALCONER, D.A. SD50
Initiation of Coronal Mass Ejections by Tether-Cutting Reconnection—Abstract Only. For presentation at the SHINE 2002 Summer Workshop, Banff, Alberta, Canada, August 18–22, 2002.

MORRIS, C.I. SD40
Simplified Analysis of Pulse Detonation Rocket Engine Blowdown Gasdynamics and Performance. For presentation at the 38th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, Indianapolis, IN, July 7–10, 2002.

MUSIELAK, Z.E.
NOBLE, M.W.
PORTER, J.G. SD50
WINGET, D.E.
Chandra Observations of Magnetic White Dwarfs and Their Theoretical Implications—Abstract Only. For publication in Astrophysical Journal Letters, 2002.

NALL, M.E. SD12
POWERS, C.B. CST, Inc.
CASAS, J.C. SD12
Space Product Development: NASA Partnering With Industry for Out-of-This-World Results—Abstract Only. For presentation at the 23rd International Symposium on Space Technology and Science, Matsue, Japan, May 26–June 2, 2002.

NALL, M.E. SD12
ROBINSON, R.K. SD12
First Commercial Operations on the *International Space Station*—Abstract Only. For presentation at the 40th AIAA Aerospace Sciences Meeting & Exhibit, Reno, NV, January 14–17, 2002.

NARITA, Y. Universitat Braunschweig
MAEZAWA, K. Inst. of Space and Astronautical Science
MUKAI, T. Inst. of Space and Astronautical Science
KULLEN, A. Royal Institute of Technology
IVCHENKO, N. Royal Institute of Technology

MARKLUND, G.T. Royal Institute of Technology
FREDERICK, R. Air Force Research Laboratory
CARLSON, C.W. University of CA, Berkeley
SPANN, J.F. SD50
ET AL.

Two Types of Transpolar Arc Development, Event Studies With Data Set of ASTRID–2, DMSP, FAST, SuperDARN—Abstract Only. For presentation at the European Geophysical Society XXVII General Assembly, Nice, France, April 21–26, 2002.

NARITA, Y. Universitat Braunschweig
MAEZAWA, K. Inst. of Space and Astronautical Science
SPANN, J.F. SD50
PARKS, G.K. University of CA, Berkeley
MARKLUND, G.T. Royal Institute of Technology
KULLEN, A. Royal Institute of Technology
IVCHENKO, N. Royal Institute of Technology
GREENWALD, R.A. Johns Hopkins University
ET AL.

Evolution of Ionospheric Convection During a Double Transpolar Arc Phenomenon on February 11, 1999—Abstract Only. For publication in Geophysical Research Letters, 2002.

NEHLS, M.K. ED31
EDWARDS, D.L. ED31
GRAY, P.A. ED31
SCHNEIDER, T.A. ED31

Ablative Laser Propulsion Using Multi-Layered Material Systems. For presentation at the AIAA 33rd Plasmadynamics and Lasers Conference, Maui, HI, May 20–23, 2002.

NESMAN, T.E. TD63

Rocket Engine Oscillation Diagnostics. For presentation at the 2002 International Congress and Exposition on Noise Control Engineering, Dearborn, MI, August 19–21, 2002.

NETTLES, A.T. ED30

Permeability After Impact Testing of Composite Laminates. For presentation at the ASTM Symposia on Composites, Pittsburg, PA, March 10–13, 2002.

NEWTON, R.L. ED36

Micro-Raman Analysis of Irradiated Diamond Films—Abstract Only. For presentation at the 5th Aerospace Materials, Processes, and Environmental Technology Conference, Huntsville, AL, September 16–18, 2002.

NGUYEN, D.D. ED25

Thermal/Fluid Analysis of a Composite Heat Exchanger for Use on the RLV Rocket Engine. For presentation at the Thermal and Fluids Analysis Workshop, Huntsville, AL, September 10–14, 2001.

NIEDERMEYER, M.W. ED34

X–33 $LH_2$ Tank Failure Investigation Findings. For presentation at the Manufacturing Problem Prevention Workshop, El Segundo, CA, February 26–27, 2002.

NIXON, D.D. TD55

System Simulation by Recursive Feedback: Coupling a Set of Stand-Alone Subsystem Simulations. For presentation at the 34th Southeastern Symposium on System Theory, Huntsville, AL, March 17–19, 2002.

NIXON, D.D. TD55

System Simulation by Recursive Feedback: Coupling a Set of Stand-Alone Subsystem Simulations. For presentation at The Huntsville Simulation Conference, Huntsville, AL, October 9–10, 2002.

NONEMAN, S.R. UP10

Operations Analysis of the Second-Generation Reusable Launch Vehicle. For presentation at the Space Ops 2002 Conference/The World Space Congress, Houston, TX, October 10–19, 2002.

NOVAK, H.L. United Space Alliance
HALL, P.B. ED32

Environmentally Compatible Vapor-Phase Corrosion Inhibitor for Space Shuttle Hardware. For presentation at the 5th Aerospace Materials, Processes, and Environmental Technology Conference, Huntsville, AL, September 16–18, 2002.

O'DELL, S.L. SD50
BLACKWELL, W.C. Sverdrup
MINOW, J.I. Sverdrup
CAMERON, R.A. Smithsonian
MORRIS, D.C. Smithsonian
VIRANI, S.N. Smithsonian

Managing Radiation Degradation of CCDs on the Chandra X-Ray Observatory—Abstract Only. For presentation and publication in the Proceedings of the SPIE Astronomical Telescopes and Instrumentation Conference, Waikoloa, HI, August 22–28, 2002.

OGLESBY, R.J. SD60
MARSHALL, S. University of North Carolina
ERICKSON, D.J., III ORNL/CSM
ROBERTSON, F.R. SD60
ROADS, J.O. SCSD/Scripps

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OGLESBY, R.J. SD60
MARSHALL, S. University of North Carolina
ERICKSON, D.J., III ORNL/CSM
ROBERTSON, F.R. SD60
ROADS, J.O. SCSD/Scripps

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O'NEILL, M.J. ENTECH, Inc.
MCDANAL, A.J. ENTECH, Inc.
GEORGE, P.J. Glenn Research Center
PISZCZOR, M.F. Glenn Research Center
EDWARDS, D.L. ED31
HOPPE, D.T. ED31
ESKENAZI, M.I. ABLE Engineering
BOTKE, M.M. ABLE Engineering
ET AL.

Development of the Ultra-Light Stretched Lens Array. For presentation at the 29th IEEE Photovoltaic Specialists Meeting, New Orleans, LA, May 20–24, 2002.

ONSTOTT, T.C. Princeton University
MOSER, D.P. Pacific Northwest National Lab
FREDRICKSON, J.K. Pacific Northwest National Lab
PFIFFNER, S.M. University of Tennessee
PHELPS, T.J. Oak Ridge National Laboratory
WHITE, D.C. University of Tennessee
PEACOCK, A. University of Tennessee
BALKWILL, D. Florida State University
HOOVER, R.B. SD50
ET AL.

Distinguishing Indigenous From Contaminating Microorganisms in Rock Samples From a Deep Au Mine in South Africa—Abstract Only. For publication in Applied and Environmental Microbiology, 2002.

OSTROGORSKY, A. Rensselaer Polytechnic Institute
MARIN, C. Rensselaer Polytechnic Institute
VOGEL, M. Rensselaer Polytechnic Institute
VOLZ, M.P. SD46
LUZ, P.L. SD46
JETER, L.B. SD46
SPIVEY, R. Tec-Masters, Inc.
DUFFAR, T. Centre d'Etudes

Microgravity Science Glovebox Investigation SUBSA—Abstract Only. For presentation at the *International Space Station* Utilization Conference, Cape Canaveral, FL, October 15–18, 2001.

PANDA, B. ED33

Characterization of Rhenium Oxides Using ESCA. For presentation at the AVS 46th International Symposium, San Francisco, CA, October 29–November 2, 2001.

PANDA, B. ED33

Type NASA–23. For publication in the Aerospace Structural Metals Handbook, 2002.

PANOV, A.D. Moscow State University
ADAMS, J.H., JR. SD50
AHN, H.S. University of Maryland
BASHINDZHAGYAN, G.L. Moscow State University
ET AL.

Software for Processing Flight and Simulated Data of the ATIC Experiment—Abstract Only. For publication in the Proceedings of the 18th European Cosmic Ray Symposium, Moscow, Russia, July 8–12, 2002.

PATEL, S.K. NRC/SD50
KOUVELIOTOU, C. USRA/SD50
WOODS, P.M. USRA/SD50
TENNANT, A.F. SD50
WEISSKOPF, M.C. SD50
FINGER, M.H. SD50
WILSON, C.A. SD50
GOGUS, E.
VAN DER KLIS, M.
BELLONI, T.

Chandra Observations of the Anomalous X-Ray Pulsar 4U 0142+61—Abstract Only. For publication in The Astrophysical Journal, 2002.

PATTON, B.W. TD40
SORENSEN, K.F. TD40

Application of Molten Salt Reactor Technology to MMW In-Space NEP and Surface Power Missions. For presentation at the 2002 American Nuclear Society Meeting—International Congress on Advanced Nuclear Power Plants, Hollywood, FL, June 9–13, 2002.

PEARSON, J.B. TD40
LEWIS, R.A. R. Lewis Co.
MARTIN, J.J. TD40
SIMS, W.H. TD40
CHAKRABARTI, S.X. TD40

RF Manipulation of Ions in the High Performance Antiproton Trap (HiPAT)—Abstract Only. For presentation at The Space Technology and Applications Forum, Albuquerque, NM, February 2–5, 2003.

PERRY, J.L. FD21

The Interaction of Spacecraft Cabin Atmospheric Quality and Water Processing System Performance. For presentation at the 32nd International Conference on Environmental Systems, San Antonio, TX, July 15–18, 2002.

PERRY, J.L. FD21
LEVAN, M.D. Vanderbilt University

Air Purification in Closed Environments: Overview of Spacecraft Systems—Abstract Only. For presentation at the Nuclear Biological Chemical Defense Collective Protection Conference, Orlando, FL, October 29–31, 2002.

PETERSEN, W.A.
CIFELLI, R.
BOCCIPPIO, D.J. SD60
RUTLEDGE, S.A.

Convection and Easterly Waves Observed in the Eastern Pacific ITCZ During EPIC–2001—Abstract Only. For presentation at and publication in the Proceedings of the American Meteorological Society 25th Conference on Hurricanes and Tropical Meteorology, San Diego, CA, April 29–May 3, 2002.

PETERSEN, W.A. UAH
CIFELLI, R. UAH
BOCCIPPIO, D.J. SD60
RUTLEDGE, S.A. SD60
FAIRALL, C.W. SD60

Convection and Easterly Wave Structure Observed in the Eastern Pacific Warm-Pool During EPIC–2001—Abstract Only. For publication in the Journal of Atmospheric Science, 2002.

PETTIGREW, P.J.
LEHOCZKY, S.L. SD46
COBB, S.D. SD46
HOLLOWAY, T.A.
KITCHENS, L.

Design Features and Capabilities of First Materials Science Research Rack—Abstract Only. For presentation at and publication in the Proceedings of the Institute of Electrical and Electronics Engineering Aerospace Conference, Big Sky, MT, March 8–15, 2003.

PIKUTA, E.V. UAH
HOOVER, R.B. SD50

Sulfate- and Sulfur-Reducing Bacteria as Terrestrial Analogs for Microbial Life on Jupiter's Satellite Io—Abstract Only. For publication in the Proceedings of the SPIE Conference on Instruments, Methods, and Missions for Astrobiology IV, San Diego, CA, July 29–August 3, 2001.

PIKUTA, E.V. UAH
HOOVER, R.B. SD50
MARSIC, D. UAH
NG, J.D. UAH

Anaerobic Halo-Alkaliphilic Bacterial Community of Athalassic, Hypersaline Mono Lake, CA—Abstract Only. For presentation at the SPIE Astronomical Telescopes and Instrumentation Conference, Waikoloa, HI, August 22–28, 2002.

PIKUTA, E.V. UAH
HOOVER, R.B. SD50
MARSIC, D. UAH
WHITMAN, W.B. Georgia University
CLELAND, D. American Type Culture
KRADER, P. American Type Culture

Desulfonatronum Paiuteum sp. nov., A New Alkaliphilic, Sulfate-Reducing Bacterium, Isolated from Soda Mono Lake, CA—Abstract Only. For publication in the International Journal of Systematic and Evolutionary Microbiology, 2002.

PIKUTA, E.V. UAH
HOOVER, R.B. SD50
WHITMAN, W.B. University of Georgia
MARSIC, D. UAH
GARRIOTT, O. UAH

Thermococcus Sulfurophilus sp. nov., A New Hyperthermophilic, Sulfur-Reducing Archaeon Isolated from Deep-Sea Hydrothermal Vent—Abstract Only. For publication in the Journal of Extremophiles, 2002.

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MARSIC, D. UAH
HOOVER, R.B. SD50
KEVBRIN, V. Georgia University
WHITMAN, W.B. Georgia University
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CLELAND, D. ATCC

Tindallia Californiensis sp. nov., A New Halo-Alkaliphilic Primary Anaerobe, Isolated from Meromictic Soda Mono Lake, CA, and the Correction of Diagnosis for Genus Tindallia—Abstract Only. For publication in the Journal of Extremophiles, 2002.

PIPPIN, G. Boeing
FINCKENOR, M.M. ED31

Measurements of Optically Transparent and Mirrored Specimens from the POSA and EOIM III Space Flight Experiments—Abstract Only. For presentation at the International Symposium on Optical Science and Technology, SPIE's 47th Annual Meeting, Seattle, WA, July 7–11, 2002.

POLETTO, G. Arcetri Astrophysical Observatory
SUESS, S.T. SD50
Solar Wind Characteristics From SOHO-Sun-Ulysses Quadrature Observations—Abstract Only. For presentation at and publication in the Proceedings of the American Institute of Physics Solar Wind 10 Conference, Pisa, Italy, June 16–21, 2002.

POLSGROVE, T.T. TD30
ADAMS, R.B. TD30
Trajectories for High Specific Impulse, High Specific Power Deep Space Exploration. For presentation at the 38th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, Indianapolis, IN, July 7–10, 2002.

POLSGROVE, T.T. TD30
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Simulation of Trajectories of High Specific Impulse Deep Space Exploration. For presentation at the 28th International Electric Propulsion Conference, Toulouse, France, March 17–21, 2003.

POWERS, C.B. SD12
NALL, M.E. SD12
CASAS, J.C. SD12
Benefits Awareness: Educating Industry, Finance, and the Public About Space Commercialization. For presentation at the 23rd International Symposium on Space Technology and Science, Matsue, Japan, May 26–June 2, 2002.

PRESSON, J.B. SD70
Materials Properties Research at MSFC—Abstract Only. For presentation at the Second Annual Technology Days, Huntsville, AL, May 22–24, 2002.

PUSEY, M.L. SD46
A Proposed Pathway for the Nucleation and Crystal Growth of the Tetragonal Form of Lysozyme—Abstract Only. For presentation at the 46th Biophysical Society Annual Meeting, San Francisco, CA, February 23–27, 2002.

PUSEY, M.L. SD46
Nucleation and Growth According to Lysozyme—Abstract Only. For presentation at the 9th International Conference on the Crystallization of Biological Macromolecules, Jena, Germany, March 23–28, 2002.

PUSEY, M.L. SD46
Tetragonal Lysozyme, From Monomer to Crystal—Abstract Only. For presentation at the 223rd American Chemical Society National Meeting, Orlando, FL, April 7–11, 2002.

PUSEY, M.L. SD46
A Proposed Model for Protein Crystal Nucleation and Growth—Abstract Only. For presentation at a seminar at The University of Alabama in Huntsville, Huntsville, AL, August 30, 2002.

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FORSYTHE, E. SD46
SUMIDA, J. SD46
MAXWELL, D. SD46
GORTI, S. SD46
Tetragonal Lysozyme Nucleation and Crystal Growth: The Role of the Solution Phase—Abstract Only. For presentation at the Sixth Microgravity Fluids Physics and Transport Phenomena Conference, Cleveland, OH, August 14–16, 2002.

QUATTROCHI, D.A. SD60
Biogeography—Introduction Only. For publication in the Encyclopedia of Life Support Systems (EOLSS), Baldwin House, Oxford, United Kingdom, 2002.

QUATTROCHI, D.A. SD60
LUVALL, J.C. SD60
RICKMAN, D.L. SD60
ESTES, M.G., JR. USRA
LAYMON, C.A. USRA
CROSSON, W. USRA
HOWELL, B.F. USRA
GILLANI, N.V. UAH
High Spatial Resolution Thermal Remote Sensing of the Urban Heat Island Effect: Assessment of Risks to Human Health and Development of Mitigation Strategies for Sustainable Cities—Abstract Only. For presentation at The North American Urban Heat Island Summit, Toronto, Canada, May 1–4, 2002.

QUATTROCHI, D.A. SD60
LUVALL, J.C. SD60
RICKMAN, D.L. SD60
LAYMON, C.A. National Space Science Center
ESTES, M.G., JR. National Space Science Center
HOWELL, B.F. National Space Science Center
A Remote Sensing Approach for Urban Environmental Decision-Making: An Atlanta, Georgia Case Study—Abstract Only. For presentation and publication in the Proceedings of Association of American Geographers 2002 Annual Meeting, Los Angeles, CA, March 19–23, 2002.

QUATTROCHI, D.A. SD60
WALSH, S.J. University of North Carolina
JENSEN, J.R. University of South Carolina
RIDD, M.K. University of Utah
Remote Sensing in Geography in the New Millennium: Prospects, Challenges, and Opportunities—Abstract Only. For publication in Geography in America, Oxford University Press, London, United Kingdom, 2002.

QUINN, J.E. TD51
Oxidizer Selection for the ISTAR Program (Liquid Oxygen Versus Hydrogen Peroxide). For presentation at the 38th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, Indianapolis, IN, July 7–10, 2002.

RAMSEY, B.D. SD50
CZT Imaging Arrays for Space Applications. For presentation at the 12th International Workshop on Room Temperature Semiconductor X- and Gamma-Ray Detectors, San Diego, CA, November 4–10, 2001.

RAMSEY, B.D. SD50
ALEXANDER, C.D. SD50
APPLE, J.A. SD50
BENSON, C.M. SD50
DIETZ, K.L. SD50
ELSNER, R.F. SD50
ENGELHAUPT, D.E. UAH
GHOSH, K.K. National Research Council
KOLODZIEJCZAK, J.J. SD50
ET AL.
HERO: Program Status and First Images From a Balloon-Borne Focusing Hard X-Ray Telescope—Abstract Only. For publication in the Proceedings of the SPIE Conference on Instruments, Methods, and Missions for Astrobiology IV, San Diego, CA, July 29–August 3, 2001.

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ELSNER, R.F. SD50
ENGELHAUPT, D.E. UAH
KOLODZIEJCZAK, J.J. SD50
O'DELL, S.L. SD50
SPEEGLE, C.O. Raytheon-ITSS
WEISSKOPF, M.C. SD50
The Development of Hard-X-Ray Optics at MSFC—Abstract Only. For presentation at and publication in the Proceedings of the SPIE Astronomical Telescopes and Instrumentation Conference, Waikoloa, HI, August 22–28, 2002.

RATHZ, T.J. UAH
ROBINSON, M.B. SD46
HYERS, R.W. SD46
ROGERS, J.R. SD46
LI, D. Westcast Industries, Inc.
Triggered Nucleation in Ni60Nb40 Using an Electrostatic Levitator—Abstract Only. For publication in the Journal of Material Science Letters, 2002.

REARDON, P. UAH
HADAWAY, J.B. UAH
GEARY, J. UAH
STAHL, H.P. SD70
ENG, R. SD70
AMSD Figure Certification Plan—Abstract Only. For presentation at the Second Annual Technology Days, Huntsville, AL, May 22–24, 2002.

REESE, E.D. University of Chicago
CARLSTROM, J.E. University of Chicago
JOY, M.K. SD50
MOHR, J.J. University of Illinois
GREGO, L. Harvard-Smithsonian
HOLZAPFEL, W.L. University of California
Determining the Cosmic Distance Scale From Interferometric Measurements of the Sunyaev-Zel'Dovich Effect—Abstract Only. For publication in The Astrophysical Journal, 2002.

RHYS, N.O. UAH
ESKRIDGE, R.H. TD40
LEE, M.H. TD40
MOSER, M.D. UAH
Frequency Analyzed Laser Light Scattering (FALLS). For publication in the Atomization and Sprays Journal, 2002.

RICHARDSON, D.E. Thiokol
MCLENNAN, M.L. Thiokol
ANDERSON, G.L. Thiokol
MACON, D.J. Thiokol
BATISTA-RODRIQUEZ, A. Thiokol
Multiaxial, Temperature, and Time-Dependent (MATT) Failure Model. For presentation at the 25th Annual Meeting of the Adhesion Society, Orlando, FL, February 10–14, 2002.

RICHMOND, R.C SD46
BORS, K. SD46
CRUZ, A. SD46
PETTENGIL, O. Dartmouth Medical School
Irradiated HMEC From A–T Heterozygous Breast Tissue—Abstract Only. For presentation at the Era of Hope Department of Defense Breast Cancer Research Program Meeting, Orlando, FL, September 25–28, 2002.

RICHMOND, R.C. SD46
CRUZ, A. SD46
BORS, K. SD46
Cancer Risk Assessment for Space Radiation. For presentation at the International Workshop on Micro- and Mini-Dosimetry and its Applications, Sydney, Australia, December 16–20, 2001.

RICHMOND, R.C. SD46
CRUZ, A. SD46
BORS, K. SD46
Radiation Effect on Human Tissue—Abstract Only. For presentation at the 40th AIAA Aerospace Sciences Meeting & Exhibit, Reno, NV, January 14–17, 2002.

RICHMOND, R.C. SD46
CRUZ, A. SD46
BORS, K. SD46
Cancer Risk Assessment for Space Radiation—Abstract Only. For presentation at the Spelman College RIMI/ Biology Seminar Series, Atlanta, GA, April 9, 2002.

ROBERTS, B.C. ED44
LEAHY, F.B. Raytheon
OVERBEY, G. Raytheon
BATTS, G.W. CSC
Natural Atmospheric Environment Model Development for the National Aeronautics Space Administration's Second-Generation Reusable Launch Vehicle. For presentation at the 10th Conference on Aviation, Range, and Aerospace Meteorology, Portland, OR, May 13–16, 2002.

ROBERTSON, F.R. SD60
FITZJARRALD, D.E. SD60
Using TRMM Data to Understand Interannual Variations in the Tropical Water Balance. For presentation at and publication in the Proceedings of the First Tropical Rainfall Measuring Mission International Science Conference, Honolulu, HI, July 22–26, 2002.

ROBERTSON, F.R. SD60
FITZJARRALD, D.E. SD60
MARSHALL, S. University of North Carolina
OGLESBY, R.J. SD60
ROADS, J.O. Scripps Institute of Oceanography
Sensitivity of the Tropical Atmospheric Energy Balance to ENSO-Related SST Changes: Comparison of Climate Model Simulations to Observed Responses—Abstract Only. For presentation at and publication in the Proceedings of the 13th Symposium on Global Change and Climate Variations, Orlando, FL, January 13–17, 2002.

ROBERTSON, F.R. SD60
FITZJARRALD, D.E. SD60
SOHN, B.-J. Seoul National University
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ROBICHAUD, J. SD70
SSG SiC Optical Systems in Space—Abstract Only. For presentation at the Second Annual Technology Days, Huntsville, AL, May 22–24, 2002.

ROBINSON, K. SD44
The Impact of Trust on Organization Commitment—Abstract Only. For presentation at the 23rd Annual Conference of the American Society for Engineering Management, Tampa, FL, October 2–5, 2002.

ROBINSON, R.K. SD12
Bringing Together Government and Industry for "Out of This World" Benefits—Abstract Only. For presentation at the Institute of Electrical and Electronics Engineering Aerospace Conference, Big Sky, MT, March 9–16, 2002.

ROCKER, M. TD64
Characterization of Low-Frequency Combustion Stability of the Fastrac Engine. For presentation at the JANNAF 38th Combustion Subcommittee Meeting, Destin, FL, April 8–12, 2002.

ROCKER, M. TD64
NESMAN, T.E. TD63
Elimination of Intermediate-Frequency Combustion Instability in the Fastrac Engine Thrust Chamber. For presentation at the Penn State University Propulsion Research Center's 13th Annual Symposium, Huntsville, AL, October 22–23, 2001.

ROCKER, M. TD64
NESMAN, T.E. TD63
Elimination of Intermediate-Frequency Combustion Instability in the Fastrac Engine Thrust Chamber. For presentation at the JANNAF 38th Combustion Subcommittee Meeting, Destin, FL, April 8–12, 2002.

ROE, F.D. ED19
HOWARD, R.T. ED19
The Successful Development of an Automated Rendezvous and Capture (AR&C) System for the National Aeronautics and Space Administration—Abstract Only.

For presentation at the Space Technology and Applications International Forum, Albuquerque, NM, February 3–6, 2003.

ROGERS, J.R. SD46
HYERS, R.W. SD46
RATHZ, T.J. UAH
KELTON, K.F. SD46
GANGOPADHYAY, A.K. SD46
WOO, G.L. SD46
HANNET, L.
KRISHNAN, S.

X-Ray and Electrostatic Levitation Undercooling Studies in Ti-Zr-Ni Quasicrystals Forming Alloys—Abstract Only. For publication in the Journal of Non-Crystalline Solids, 2002.

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HYERS, R.W. SD46
RATHZ, T.J. SD46
ROBINSON, M.B. SD46
KELTON, K.F. SD46
GANGOPADHYAY, A.K. SD46
WOO, G.L. SD46
FOUNTAIN, G.J. SD46
HUIE, D.H. SD46
ET AL.

MSCF ESL Facility and Beamline Studies—Abstract Only. For presentation at the Microgravity Materials Science Conference, Huntsville, AL, June 25–26, 2002.

ROGERS, T. UAH
GEARY, J. UAH
STAHL, H.P. SD70

MSFC/UAH Full Aperture Cryo-Figure AMSD Modal Characterization—Abstract Only. For presentation at the Second Annual Technology Days, Huntsville, AL, May 22–24, 2002.

RUSSELL, S.S. ED32
WALKER, J.L. ED32

Efficient Nondestructive Evaluation of Prototype Carbon Fiber Reinforced Structures—Abstract Only. For presentation at the 2002 Assurance Technology Conference, Cleveland, OH, May 29–30, 2002.

RUSSELL, S.S. ED32
WALKER, J.L. ED32
WORKMAN, G.L. UAH

Efficient Nondestructive Evaluation of Prototype Carbon Fiber Reinforced Structures For presentation at the 10th Japan-U.S. Conference on Composite Materials, Stanford University, Stanford, CA, September 16–18, 2002.

SCHAUDEL, D. MPE, Germany
BECKER, W. MPE, Germany
VOGES, W. MPE, Germany
REICH, W. MPIfR, Germany
WEISSKOPF, M.C. SD50

Galactic SNR Candidates in the ROSAT All-Sky Survey—Abstract Only. For presentation at and publication in the Proceedings of the Seminar on Neutron Stars, Pulsars, and Supernova Remnants, Bad Honnef, Germany, January 21–25, 2002.

SCHLAGHECK, R.A. SD41

*ISS* Microgravity Research Payload Training Methodology—Abstract Only. For presentation at the *International Space Station* Utilization Conference, Cape Canaveral, FL, October 15–18, 2001.

SCHLAGHECK, R.A. SD44

A New Direction for the NASA Materials Science Research Using the *International Space Station*—Abstract Only. For presentation at the *ISS* Utilization–The Microgravity Environment Conference/The World Space Congress, Houston, TX, October 10–19, 2002.

SCHNEIDER, M.P. FD41
LIPPINCOTT, E.J. FD41
CHUBB, S.A. FD41
WHITAKER, J.P. FD41
RICE, J.K. FD41
GILLIS, R.M. FD41
SIMS, C.L. FD41
SELLERS, D.A. FD41

Telescience Resource Kit—Abstract Only. For presentation at the Space Ops 2002 Conference/The World Space Congress, Houston, TX, October 10–19, 2002.

SCHNEIDER, T.A. ED31
HANSEN, H.D. ED31
CARRUTH, M.R., JR. ED31

Minimum Arc Threshold Voltage Experiments on Extravehicular Mobility Unit Samples—Abstract Only. For presentation at the 40th AIAA Aerospace Sciences Meeting & Exhibit, Reno, NV, January 14–17, 2002.

SCHNELL, A.R. Tennessee Tech University
LEIGH, L.M., JR. South Dakota State University
TINKER, M.L. ED21

Deployment, Foam Rigidization, and Structural Characterization of Inflatable Thin-Film Booms. For presentation at the 43rd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Denver, CO, April 22–25, 2002.

SCHWEIZER, M. USRA
VOLZ, M.P. SD46
COBB, S.D. SD46
CROELL, A. University of Freiberg
DOLD, P. University of Freiburg
SZOFRAN, F.R. SD46

The Detached Bridgman Process: Application for the Growth of Low-Defect Germanium Crystals—Abstract Only. For presentation at the Annual Meeting of the German Society for Crystal Growth, Idar-Oberstein, Germany, March 20, 2002.

SCHWEIZER, M. USRA
VOLZ, M.P. SD47
COBB, S.D. SD47
MOTAKEF, S. Cape Simulations, Inc.
SZOFRAN, F.R. SD47

Stability of Detached Grown Germanium Single Crystals—Abstract Only. For publication in the Journal of Crystal Growth, 2002.

SCOTT, D.W. FD35

Console Log Keeping Made Easier—Tools and Techniques for Improving Quality of Flight Controller Activity Logs—Abstract Only. For presentation at the Space Ops 2002 Conference/The World Space Congress, Houston, TX, October 10–19, 2002.

SEGRE, P.N. SD46

Inertial Screening in Sedimentation—Abstract Only. For presentation at the APS Division of Fluid Dynamics 54th Meeting, San Diego, CA, November 18–20, 2001.

SEGRE, P.N. SD46

Effective Gravitational Temperature in Sedimentation—Abstract Only. For presentation at the Physics Colloqium, Brown University, Providence, RI, March 5, 2002.

SEGRE, P.N. SD46

Origin of Stability in Sedimentation—Abstract Only. For publication in Physical Review Letters, 2002.

SELLERS, D.A. FD41
PITTS, L. Lockheed Martin
BRYANT, B. Lockheed Martin

A Ground Systems Architecture Transition for a Distributed Operations System. For presentation at the Space Ops 2002 Conference/The World Space Congress, Houston, TX, October 10–19, 2002.

SEVER, T.L. SD60
IRWIN, D.E. SD60

Recent Advances in Maya Studies Using Remotely Sensed Data—Abstract Only. For presentation at and publication in the Proceedings of The Reconstruction of Archaeological Landscapes Through Digital Technologies Conference, Boston, MA, November 1–3, 2001.

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Landscape Archeology: Remote Sensing Investigation of the Ancient Maya in the Peten Rainforest of Northern Guatemala—Abstract Only. For publication in Ancient Mesoamerica, Vanderbilt University, TN, 2002.

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LEE, J.A. ED33
BHAT, B.N. ED33
WELLS, D.N. ED33
GREGG, W. ED33
MARSH, M. TD61
GENGE, G. TD61
FORBES, J.C. TD61
ET AL.

Metal Matrix Composite Lox Turbopump Housing via Novel Toolless Net-Shape Pressure Infiltration Casting Technology—Abstract Only. For presentation at the 5th Aerospace Materials, Processes, and Environmental Technology Conference, Huntsville, AL, September 16–18, 2002.

SHAH, S.R. ED33
WELLS, D.N. ED33
STANTON, W. ED33
LAWLESS, K.G. ED33
RUSSELL, C.K. ED33
WAGNER, J. Langley Research Center
DOMACK, M. Langley Research Center
BABEL, H. Boeing
FARAHMAND, B. Boeing
ET AL.

Effects of Thermal Exposure on Properties of Al-Li Alloys—Abstract Only. For presentation at the 5th Aerospace Materials, Processes, and Environmental Technology Conference, Huntsville, AL, September 16–18, 2002.

SHARIETT, C.A. FD24

Launch Vehicle/Carrier Interaction, Improving the Analytical Integration Process—Abstract Only. For presentation at the Space Ops 2002 Conference/The World Space Congress, Houston, TX, October 10–19, 2002.

SHARP, J.R. ED26
Thermal Orbital Environmental Parameter Study on the Propulsive Small Expendable Deployer System (ProSEDS) Using Earth Radiation Budget Experiment (ERBE) Data—Abstract Only. For presentation at the Thermal & Fluids Analysis Workshop, Houston, TX, August 12–16, 2002.

SHAW, J.N. SD60
LUVALL, J.C. SD60
RICKMAN, D.L. Auburn University
MASK, P.L.
WERSINGER, J.M.
SULLIVAN, D.G.
Application of Thermal Infrared Remote Sensing for Quantitative Evaluation of Crop Characteristics—Abstract Only. For presentation at and publication in the Proceedings of the Workshop on Multi/Hyperspectral Technology and Applications, Redstone Arsenal, AL, February 5–7, 2002.

SHELL, M.T. FD33
High-Rate Communications Outage Recorder Operations for Optimal Payload and Science Telemetry Management Onboard the *International Space Station*—Abstract Only. For presentation at the Space Ops 2002 Conference/The World Space Congress, Houston, TX, October 10–19, 2002.

SHIMIZU, H.M. SD50
KAWASAKI, Y. SD50
TAKIZAWA, Y. SD50
SAKAKI, N. SD50
TESHIMA, M. SD50
EBISUZAKI, T. SD50
TAKAHASHI, Y. SD50
ADAMS, J.H., JR. SD50
CATALANO, O. SD50
ET AL.
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ZHU, J.J. Ohio University
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KHAZANOV, G.V. UAH
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ZOLADZ, T.F. TD63
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SLEDD, A.M. FD31
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MARTIN, A.K. TD40
CHAVERS, G. TD40
THIO, Y.C.F. TD40
JONES, J. TD40
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PALEY, M.S. USRA
FRAZIER, D.O. SD46
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REYNOLDS, D.W. FD36
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An Analysis of Computer-Aided Design (CAD) Packages Used at MSFC for the Recent Initiative to Integrate Engineering Activities. For presentation at The University of Alabama in Huntsville, Huntsville, AL, October 2002.

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FIKES, J. FD02
ROY, S. Futron Corp.
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VAN DER WOERD, M.J. SD46
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SIDES, S. Pratt & Whitney
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SOKOLSKAYA, N.V. Moscow State University
ADAMS, J.H., JR. SD50
AHN, H.S. University of Maryland
BASHINDZHAGYAN, G.L. Moscow State University
ET AL.
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KINTNER, P. Cornell Univesity
The Living With a Star Geospace Investigations—Abstract Only. For presentation at the 4th Oersted International Workshop, Copenhagen, Denmark, September 23–27, 2002.

SPEEGLE, C.O. Raytheon
RAMSEY, B.D. SD50
ENGELHAUPT, D.E. UAH
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SPENCER, S.H. FD23
PHILLIPS, M.W. Boeing
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STAHL, H.P. SD70
Status of NASA Mirror Technology Development for Large Space Telescopes—Abstract Only. For presentation at the Second Annual Technology Days, Huntsville, AL, May 22–24, 2002.

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Status of NASA Mirror Technology Development for Large Space Telescopes—Abstract Only. For presentation at OSA OF&T Meeting, Tucson, AZ, June 2–5, 2002.

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Developments in Hollow Graphite Fiber Technology—Abstract Only. For presentation at the Second Annual Technology Days, Huntsville, AL, May 22–24, 2002.

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MOORE, R.L. SD50
THOMPSON, B.J. Goddard Space Flight Center
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BURGER, A. Fisk University
DUDLEY, M. State University of New York
RAMACHANDRAN, N. USRA
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SU, C.-H. SD46
SHA, Y.G. SD46
LEHOCZKY, S.L. SD46
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GILLIES, D.C. SD46
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SUE, J. Texas A&M University
OCHOA, O.O. Texas A&M University
EFFINGER, M.R. ED34
Thermophysical ESEM Characterization of Carbon Fibers—Abstract Only. For presentation at the 26th Annual Conference on Composites, Materials, & Structures, Cocoa Beach, FL, January 28–31, 2002.

SUESS, S.T. SD50
The 3D Heliosphere: What Can We Learn From STEREO?—Abstract Only. For presentation at the First STEREO Workshop, Paris, France, March 18–20, 2002.

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NERNEY, S. Ohio University
Flow in Streamer Boundaries and Streamer Stability—Abstract Only. For presentation at the 34th COSPAR Scientific Assembly/The World Space Congress, Houston, TX, October 10–19, 2002.

SUGGS, R.J. SD60
JEDLOVEC, G.J. SD60
LAPENTA, W.M. SD60
HAINES, S.L. UAH
Land Surface Temperature Retrievals From GOES–8 Using Emissivities Retrieved From MODIS—Abstract Only. For presentation at the 83rd Annual Meeting of the American Meteorological Society, Long Beach, CA, February 9–13, 2003.

SULLIVAN, D.G.
SHAW, J.N.
RICKMAN, D.L.
MASK, P.L.
LUVALL, J.C. SD60
WERSINGER, J.M.
High-Resolution Multispectral Remote Sensing of Crop Residue—Abstract Only. For presentation at and publication in the Proceedings of the Workshop on Multi/Hyperspectral Technology and Applications, Redstone Arsenal, AL, February 5–7, 2002.

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MOTAKEF, S. Cape Simulations, Inc.
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WESTBROOK, J.W. UAH
The Impact of Organization Culture on Satisfaction of Engineers in Technology. For presentation at the 22nd ASEM National Conference, Engineering Management: It's About People!, Huntsville, AL, October 11–13, 2001.

TAYLOR, J.L. TD15
NEELY, M.A. TD15
CURRAN, F.M. SAIC
CHRISTENSEN, E.R. SAIC
ESCHER, D. SAIC
LOVELL, N. SAIC
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2-D Magnetohydrodynamic Modeling of a Pulsed Plasma Thruster. For presentation at the AIAA 33rd Plasmadynamics and Lasers Conference, Maui, HI, May 20–23, 2002.

THIO, Y.C.F. TD40
CASSIBRY, J.T. UAH
ESKRIDGE, R.H. TD40
KIRKPATRICK, R.C. Los Alamos National Laboratory
KNAPP, C.E. Los Alamos National Laboratory
LEE, M.L. TD40
MARTIN, A.K. TD40
SMITH, J.W. TD40
WU, S.T. UAH
Magnetized Target Fusion Driven by Plasma Liners—Abstract Only. For presentation at the Innovative Confinement Concepts 2002, College Park, MD, January 22–24, 2002.

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CASSIBRY, J.T. UAH
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MARKUSIC, T.E. TD40
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ESKRIDGE, R.H. TD40
LEE, M.L. TD40
MARTIN, A.K. TD40
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WU, S.T. UAH
SANTARIUS, J.F. University of Wisconsin
Plasma Liner Research for MTF at NASA Marshall Space Flight Center—Abstract Only. For presentation at the Innovative Confinement Concepts 2002, College Park, MD, January 22–24, 2002.

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MARTIN, A.K. TD40
SMITH, J.W. TD40
LEE, M.L. TD40
CASSIBRY, J.T. UAH
GRIFFIN, S.T. University of Memphis
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KIRKPATRICK, R.C. Los Alamos National Laboratory
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KNAPP, C.E. Los Alamos National Laboratory
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SANTARIUS, J.F. University of Wisconsin
SCHMIDT, G.R. TD40
TURCHI, P.J. Air Force Research Laboratory
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MARKUSIC, T.E. TD40
CASSIBRY, J.T. TD40
SOMMER, J.C. TD40
Pulsed Electromagnetic Acceleration of Plasma: A Review—Abstract Only. For presentation at The American Physical Society Division of Plasma Physics Annual Meeting, Orlando, FL, November 11–15, 2002.

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Some Considerations on the Pulsed Electromagnetic Acceleration of Plasma—Abstract Only. For presentation at The American Physical Society Division of Plasma Physics Annual Meeting, Orlando, FL, November 11–15, 2002.

THOMAS, D. UP10
SMITH, C.A. UP10
SAFIE, F.M. UP10
KITTREDGE, S.L. UP10
Life Cycle Systems Engineering Approach to NASA's Second Generation Reusable Launch Vehicle—Abstract Only. For presentation at a workshop on Life Cycle Systems Engineering, Redstone Arsenal, AL, November 6–7, 2002.

THOMAS, D. VS01
SMITH, C.A. UP10
THOMAS, L. UP10
KITTREDGE, S.L. UP10
Systems Engineering Approach to Technology Integration for NASA's Second Generation Reusable Launch Vehicle—Abstract Only. For presentation at the Space Technology and Applications International Forum, Albuquerque, NM, February 2–5, 2003.

THOMAS, M.E. CFD Research Corp.
BOSSARD, J.A. CFD Research Corp.
EARLY, J. Los Alamos National Laboratory
TRINH, H.P. TD61
DENNIS, J. TD61
Laser Ignition Technology for Bi-Propellant Rocket Engine Applications—Abstract Only. For presentation at the Penn State University Propulsion Research Center's 13th Annual Symposium, Huntsville, AL, October 22–23, 2001.

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EARLY, J. Los Alamos National Laboratory
TRINH, H.P. TD61
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TRINH, H.P. TD61
BULLARD, B. TD61
KOPICZ, C. Sverdrup
MICHAELS, S. U.S. Army Missile Command
Evaluation of Impinging Stream Vortex Chamber Concepts for Liquid Rocket Engine Applications—Abstract Only. For presentation at the JANNAF Subcommittee Joint Meeting, Destin, FL, April 8–12, 2002.

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RANGEL, R. SD46
COIMBRA, C. SD46
WITHEROW, W.K. SD46
ROGERS, J.R. SD46
LAL, R.B. SD46
Small Particle Response to Fluid Motion Using Tethered Particles To Simulate Microgravity—Abstract Only. For presentation at and publication in the Proceedings of the Microgravity Materials Science Conference, Huntsville, AL, June 25–26, 2002.

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An Automated Optical Fiber Puller for Use in Low-Earth Orbit—Abstract Only. For presentation at the XIIIth International Symposium on Non-Oxide Glasses and New Optical Glasses, Pardubice, Czech Republic, September 9–13, 2002.

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NETTLES, A.T. SD70
CAGLE, H.A. SD70
Dynamic Fatigue of a Titanium Silicate Glass—Abstract Only. For publication in the Journal of Materials Science, 2002.

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SALVAIL, P. IITRI
Solar-Thermal Engine Testing. For presentation at the Space Technology and Applications International Forum, Albuquerque, NM, February 3–6, 2002.

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BARLEY, B.L. FD31
Utilizing the U.S. Lab Nadir Research Window for Remote Sensing Operations With the Window Observational Research Facility (WORF)—Abstract Only. For presentation at the 53rd International Astronautical Congress of the International Astronautical Federation/ The World Space Congress, Houston, TX, October 10–19, 2002.

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NASA Hydrogen Peroxide Propulsion Perspective. For presentation at the 5th International Hydrogen Peroxide Propulsion Conference, West Lafayette, IN, September 15–19, 2002.

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AVANOV, L.A. SD50
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GODFROY, T.J. TD40
DICKENS, R.E. TD40
POSTON, D.I. Los Alamos National Lab
KAPERNICK, R. Los Alamos National Lab
REID, P. Los Alamos National Lab
SALVAIL, P. ITT Research Institute
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HRBUD, I. ERC, Inc.
GODDFELLOW, K. Jet Propulsion Lab
An End-to-End Test of a Simulated Nuclear Electric Propulsion System. For presentation at the 38th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, Indianapolis, IN, July 7–10, 2002.

VESELY, J.J. ED33
BHAT, B.N. ED33
MCPHERSON, W.B. Morgan Research Corp.
GRETHLEIN, C.E. IIT Research Institute
Reproducibility and Repeatability of Tensile and Low Cycle Fatigue Properties in Propulsion Grade Hydrogen—Abstract Only. For presentation at the Hydrogen Effects on Material Behavior & Corrosion Deformation Interaction International Conference, Morgan, WY, September 22–26, 2002.

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Development of a Launch Vehicle Manufacturing Process—Chapter Four. For presentation at the Space Launch and Transportation Systems: Design and Operations Symposium, Breckenridge, CO, February 11–13, 2002.

VICKERS, J.H. ED34
FRAZIER, M.K. ED34
NASA's National Center for Advanced Manufacturing—Abstract Only. For presentation at the SAE Aerospace Manufacturing Technology Conference & Exhibition, Hartford, CT, June 3–7, 2002.

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FRAZIER, M.K. ED34
NASA's National Center for Advanced Manufacturing—Abstract Only. For presentation at the 13th Annual Advanced Aerospace Materials and Processes Conference & Exposition, Orlando, FL, June 10–13, 2002.

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Nonlinear Refractive Properties—Abstract Only. For publication in the Journal of Applied Optics, 2001.

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Main Engine Prototype Development for 2nd-Gen RLV RS–83. For presentation at the 1st AIAA/IAF Symposium on Future Reusable Launch Vehicles, Huntsville, AL, April 11–12, 2002.

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SCHWEIZER, M. USRA/SD46
COBB, S.D. SD46
WALKER, J.S. University of Illinois
SZOFRAN, F.R. SD46
Bridgman Growth of Germanium Crystals in a Rotating Magnetic Field—Abstract Only. For presentation at the Fourteenth American Conference on Crystal Growth and Epitaxy, Seattle, WA, August 4–9, 2002.

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SCHWEIZER, M. USRA/SD46
KAISER, N. University of Freiburg
COBB, S.D. SD46
VUJISIC, L. Cape Simulations, Inc.
MOTAKEF, S. Cape Simulations, Inc.
SZOFRAN, F.R. SD46
Bridgman Growth of Detached GeSi Crystals—Abstract Only. For publication in the Journal of Crystal Growth, 2002.

WALKER, J.L. ED32
RUSSELL, S.S. ED32
SUITS, M.W. ED32
WORKMAN, G.L. UAH
WATSON, J.M. UAH
Fatigue Crack Measurement in Composite Materials by Ultrasonic Methods—Abstract Only. For presentation at

the American Society for Nondestructive Testing Spring Conference and 11th Annual Research Symposium, Portland, OR, March 18–22, 2002.

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WORKMAN, G.L. UAH
WATSON, J.M. UAH

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WALKER, J.S. University of Illinois
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CROELL, A. University of Freiberg
VOLZ, M.P. SD47
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Solutocapillary Convection in the Float-Zone Process With a Strong Magnetic Field—Abstract Only. For publication in the International Journal of Heat and Mass Transfer, 2002.

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MOTAKEF, S. Cape Simulations

Effects of a Rotating Magnetic Field on Gas Transport During Detached Crystal Growth in Space—Abstract Only. For publication in the Journal of Materials Synthesis and Processing, 2002.

WALUKIEWICZ, W. Lawrence Berkeley National Lab
WU, J. Lawrence Berkeley National Lab
YU, K.-M. Lawrence Berkeley National Lab
AGER, J.W., III Lawrence Berkeley National Lab
HALLER, E.E. University of CA, Berkeley
MIOTKOWSKI, I. Purdue University
RAMDAS, A.K. Purdue University
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RHODES, R. University of Tennessee Space Institute

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Tightly Coupled Inertial Navigation System/Global Positioning System (TCMIG)—Abstract Only. For presentation at the NanoSpace 2002 Conference, Galveston, TX, June 24–28, 2002.

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OSBORNE, R.J. ERC, Inc.
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Measuring Rocket Engine Temperatures With Hydrogen Raman Spectroscopy. For presentation at the Penn State University Propulsion Research Center's 13th Annual Symposium, Huntsville, AL, October 22–23, 2001.

WEISSKOPF, M.C. SD50

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